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ABSTRACT

The VisiCalc program is visual calculation on a computer making use of an electronic worksheet that is beneficial to the business user in dealing with numerous accounting and clerical procedures. The Lotus 1-2-3 program begins with VisiCalc and improves upon it by adding graphics and a database as well as more efficient ways to manipulate and calculate on an electronic worksheet. This unit is designed to help the student become a confident user of VisiCalc or Lotus 1-2-3 quickly and with a minimum expenditure of effort. The unit is two-fold in that the student learns how to operate a program called VisiCalc or Lotus 1-2-3, in addition to learning many of the concepts, terms, and functions needed in general to operate programs containing an electronic worksheet. The unit, designed to be covered in three weeks, consists of seven sections. The first section of the guide is an introduction that also contains student behavioral objectives and a lesson plan outline. Lessons and exercises for VisiCalc and Lotus 1-2-3 make up the second and third sections of the guide, with suggested applications to business following in the fourth section. Suggested tests for the two programs are presented in sections five and six. A bibliography completes the unit. (KC)

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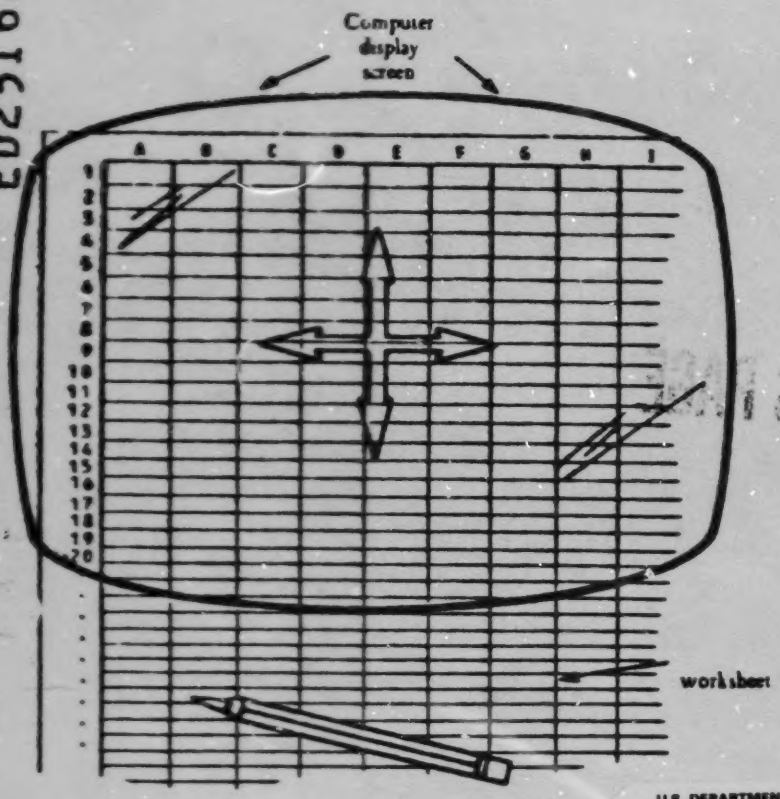

SPREADSHEET APPLICATIONS Using VISICALC and LOTUS 1-2-3 Programs

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Gail Sobel
Consultant,
Thelma Gannon

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INTRODUCTION

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OVERVIEW OF UNIT

Many problems are commonly solved with a calculator, a pencil and a sheet of paper--three nearly universal tools. These tools are put into service to calculate such things as financial ratios, personal budgets, cost estimates, and checkbook reconcilations. The Electronic Worksheet programs came into being so these and other worksheet operations could be performed with less difficulty and more accuracy.

The VisiCalc and Lotus 1-2-3 programs give the user the convenience and familiarity of a pocket calculator with the powerful memory and electronic screen capabilities of a personal computer. The advantage over the older methods is that VisiCalc and Lotus 1-2-3 remember the formulas and calculations being used in solving a problem. In addition, these programs make recalculation effortless as opposed to messy correction requiring much recopying and refiguring.

VisiCalc and Lotus 1-2-3 are being used as effective tools in business to assist operators in performing various office and bookkeeping procedures. The advantage of these programs is that they can be applied to many different applications rather than purchasing separate software packages to perform diversified tasks in financial operations.

Specific applications of an Electronic Worksheet can be learned on the job, but it is important for the students to grasp the process involved in performing calculations through the use of an Electronic Worksheet. In this unit, therefore, students will learn the basic concepts and skills to operate the VisiCalc and Lotus 1-2-3 programs through a series of lessons and exercises. They will be able to apply these concepts and skills to common business problems.

The popularity of programs using Electronic Wroksheets is growing, and students having the capabilities to operate these programs will surely find themselves better prepared in future job situations. Moreover, students who can work with programs such as VisiCalc or Lotus 1-2-3 will surely have the competative edge in the labor market in the future.

INTRODUCTION TO THE TEACHER

VisiCalc is Visual Calculation on a computer making use of an Electronic Worksheet which is beneficial to the business user in dealing with numerous accounting and clerical procedures. Lotus 1-2-3 begins with VisiCalc and improves upon it by adding graphics and a data base as well as more efficient ways to manipulate and calculate on an Electronic Worksheet.

This unit is designed to help the student become a confident, efficient user of VisiCalc or Lotus 1-2-3 quickly and with a minimum expenditure of effort. The unit is two-fold in that the student learns how to operate a program called VisiCalc or Lotus 1-2-3, in addition to learning many of the concepts, terms and functions needed in operating programs containing an Electronic Worksheet.

The teachers should familiarize themselves with the VisiCalc or Lotus 1-2-3 program before proceeding with this unit's step-by-step exercises to assess the capabilities of each program. The unit is applicable wherever a worksheet having rows and columns must be calculated. The entire unit, if presented as outlined, will take approximately three weeks to complete. Depending on the course objectives teachers may choose to select only those exercises and applications they find appropriate for the business course being taught.

The developers of this unit felt that the teacher would present and demonstrate some ViciCalc and/or Louts 1-2-3 applications in Business Dynamics in the Computer Literacy Module. In Accounting/Bookkeeping, Record Keeping and Office Procedures, it would be desirable for students to have hands-on experience using these programs.

STUDENT BEHAVIORAL OBJECTIVES

At the end of this unit, the student should be able to:

1. Define Electronic Worksheet and state at least three types of applications for the Electronic Worksheet in business organizations.

2. Describe the advantages of using the Electronic Worksheet to calculate business problems over the manual (paper and pencil) or mechanical (adding or calculating machine) methods of data processing.

3. List the 4 steps in the data processing cycle and demonstrate these steps in the applications included in this unit.

4. Demonstrate the proper use of hardware and software while performing exercises and applications in this unit.

5. Define and use the key terms used in VisiCalc or Lotus 1-2-3.

6. Move the locate coordinates on the Electronic Worksheet in the most efficient manner appropriate to the program.

7. Label columns and rows on the Electronic Worksheet with either letters, numbers, or symbols.

8. Describe what a formula is and use formulas to process data entered on the Electronic Worksheet.

9. Apply the function formulas to find a sum, find an average, find a maximum value, and find a minimum value in a range of coordinates.

10. Execute the commands appropriate for the exercises and applications contained in this unit.

11. Demonstrate the correct procedure to save and retrieve files using the commands required in the program.

12. Demonstrate the correct procedure to print a worksheet from the screen using the commands required in the program.

13. Describe the concept Replicating (VisiCalc) or Copying (Lotus 1-2-3) and demonstrate either process in a sample exercise.

14. Input common business applications using VisiCalc or Lotus 1-2-3 programs appropriate to the business course being taught with accurate format and calculations.

LESSON PLAN OUTLINE

I. INTRODUCTION

A. Define Electronic Worksheet
B. Uses of Electronic Worksheet programs (VisiCalc and Lotus 1-2-3)
   1. As a powerful business tool
   2. In business applications
C. Differences in Methods of Data Processing
   1. Manual or Mechanical
      a. Mental arithmetic/Paper and pencil
      b. Adding/Calculating machines
   2. Electronic with spreadsheet programs
      a. VisiCalc
      b. Lotus 1-2-3

II. THE DATA PROCESSING CYCLE

A. Data Origination (Source Documents)
B. Input (Entering Data)
C. Processing (Manipulating Data through the CPU)
D. Output (Hard or Soft Copy)

III. OPERATING COMPUTER HARDWARE AND SOFTWARE

A. Care in Handling Diskettes
B. Power Up and Power Down Procedures
C. Introduction to Computer Components
   1. Keyboard--to input data
   2. CPU--to process data
   3. Disk drives--storage device
   4. Printer--produce output

IV. LESSONS AND EXERCISES FOR THE VISICALC PROGRAM

A. Key Terms
B. Moving the Cursor
C. Labeling Columns and Rows
D. Entering Values and Formulas
E. Working with Functions
F. Using Commands
G. Saving and Retrieving
H. Printing
I. Replicating
   1. The Concept
   2. The Process

LESSON PLAN OUTLINE (Continued)

V. LESSONS AND EXERCISES FOR THE LOTUS 1-2-3 PROGRAM

- A. Getting Started
  - 1. The Keyboard
  - 2. The Display
  - 3. Key Terms
- B. Moving the Cursor
- C. Entering Numbers, Formulas and Labels
- D. Using Commands to Save and Retrieve Files
- E. Working with Formulas Using @ Functions
- G. Copy Command

VI. SUGGESTED APPLICATIONS

- A. Sales and Expense Report
- B. Personal Budget
- C. Comparison of Budgeted and Actual Expenses
- D. Bank Reconciliation Statement
- E. Figuring Gross Pay
- F. Financial Statements
  - 1. Trial Balance
  - 2. Income Statement
  - 3. Balance Sheet

VII. EVALUATION

- A. Objective Test (Suggested)
  - 1. Fill-ins
  - 2. Matching
  - 3. Short Essay
- B. Skill Test

LESSONS AND EXERCISSES

FOR

VISICALC

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PROCEDURE FOR VISICALC

Instruction is presented for the following topics. It is recommended that you take these in order.

Lesson 1	Key Terms You Need To Know
Lesson 2	Moving The Cursor On The Worksheet
Lesson 3	Labeling Columns And Rows
Lesson 4	Entering Values And Formulas
Lesson 5	Working With Functions
Lesson 6	Using Commands
Lesson 7	Saving And Retrieving Your Work
Lesson 8	Printing Work
Lesson 9	Replicating: The Concept Replicating: The Process

What You Need:

1. An Apple II or Apple II Plus with at least 48K of memory.
2. An Apple II disk drive
3. A TV set or video monitor
4. A printer
5. VisiCalc software (recommended: VisiCalc User's Guide for the Apple II and II Plus 16 Sector Version #10911-22100 and Cdex Training for Visi-Calc.
6. Some blank 5 1/4" diskettes.

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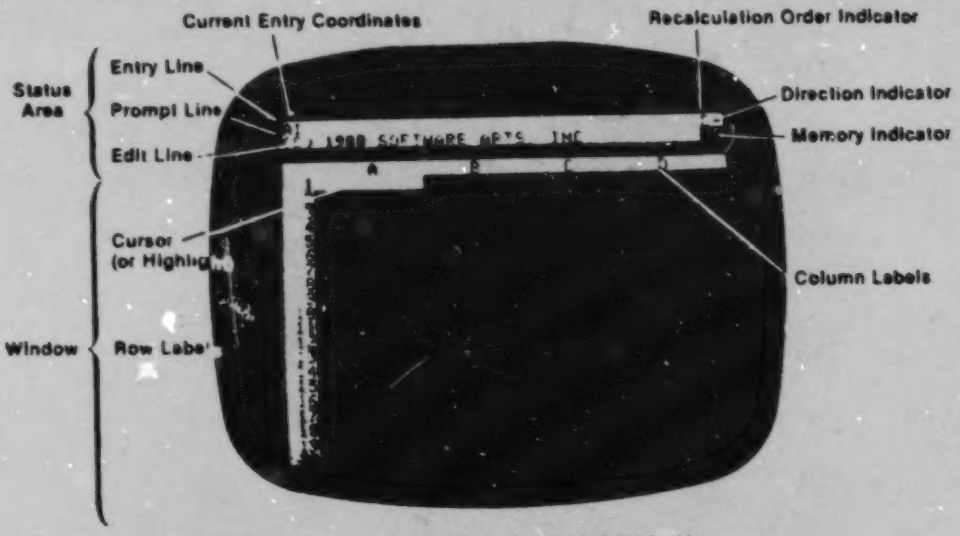
LESSON 1

KEY TERMS YOU NEED TO KNOW

In order to operate VISICALC effectively, you must know some "key" terms. These terms are displayed on the chart and explained below.

Electronic Worksheet: an electronic display organized as a grid of columns and rows enabling you to set up charts, records, tables, etc., enter values or labels where the rows and columns intersect, and calculating or manipulating values to reach desired results.



THE VISICALC SCREEN

Columns: horizontal positions across the top grid of the electronic worksheet. Rows are lettered A, B, C, D, . . .BK (63 rows across the entire worksheet.

Rows: vertical positions up and down the left side of the grid of the electronic worksheet. Rows are numbered 1, 2, 3, . . .254. (254 vertical rows).

Entry position: each intersection of a row and a column coordinate. (Examples: A1, B3, C17).

Display Area or Status Area: the highlighted bar at the top of the screen just above the column labels. This bar is actually two lines--the top line is called the entry line (where the current entry coordinates have been entered). The second line called the prompt line displays the current function being performed.

Work Area or Window: the area under the column labels and rows in which labels or values are entered, manipulated, and displayed.

KEY TERMS (Continued)

Edit line: the dark area between the status area and window in which data are first entered enabling corrections to be made before the data is entered into the work area.

Cell or Coordinate: the place at which a row and column intersect. Each cell has storage capacity so you can place a LABEL (such as APRIL, COST, PRICE) or a VALUE (such as 267.55, 10,123), or an arithmetic FORMULA (such as .55*B5).

Cursor: the highlighted block in the work area that gives you access to any cell on the electronic worksheet. By locating the cursor over the cell, you can enter, change, or delete information in any cell.

Label: any entry which starts with a letter.

Value: any number or formula entered on the worksheet.

Formula: an instruction for program to calculate a number.

Function: built in "formulas" to perform particular calculations - (For example @ sum replacing B1 + B2 + B3 functions are always preceded by @.

Range: a cell or rectangular group of cells on the worksheet defined by naming the coordinates to be included.

LESSON 2

MOVING THE CURSOR

The cursor can be moved in two ways:

1. One cell at a time -- horizontally or vertically.
2. Direct move -- from one cell to any other cell in one jump.

To move the cursor one cell at a time, use the left arrow and right arrow keys ← → if you are using an Apple II or Apple II Plus computer. If you are using the Apple IIe version of VisiCalc, use the four arrow keys ← → ↑ ↓ to move the cursor on the worksheet. If you are using only the left and right arrows, you must use the space bar to change the direction of the cursor movement. Notice the recalculation order indicator and direction indicator in the status area in the right hand corner at the top of the screen. The (-) enables you to use the left and right arrows to move horizontally (across) the worksheet. By pressing the space bar once, you will see a (!). Now you may use your left and right arrows to move vertically (up and down) the worksheet.

To move the cursor in bigger jumps, directly from one cell to any other cell, use the SHIFT key and the greater than symbol > . The words GOTO: COORDINATE will appear on the screen. Type the cell you wish to move to and then press RETURN. Your cursor will jump to the new location. For example: if your cursor was at C3 and you want to move to D12, press SHIFT > RET and type D12 RET your cursor will move in one jump to D12.

EXERCISE 1

Moving the Cursor on the Worksheet

Insert VisiCalc Disk.

A blank VisiCalc worksheet should now be showing on your screen. Note that the cursor is at A1. The Direction Indicator is - (horizontal). Press RETURN and the copyright information will disappear.

Please make the following keyboard entries in the order given.

1. Use → key to step your cursor to the right to H1.
2. Use ← key to step your cursor left to A1. Note that if you try to go farther left than A1, the cursor will bump into the edge of the worksheet with a sound, "Thud". Try it.
3. Press SPACE BAR. Note how the cursor Direction Indicator in the upper right corner of your screen flips to ! (vertical).
4. Use ↓ key to step your cursor down to A12.
5. Use ← key to step your cursor back to A1.
6. Press SHIFT and > key. Note how GO TO: COORDINATE appears on the prompt line.
7. Type A12 on the edit line.
8. Press RETURN. Notice the cursor jump.
9. (You should now be at A12.) Move your cursor to BK 254 (the lowest right corner of the VisiCalc worksheet) and then back to A1. Use either the GO TO jump method or the step-by-step method.
10. Try holding down the REPT (Repeat) key and ← or → simultaneously. Rapid stepping!
11. When you have finished experimenting with moving your cursor, power down ending the session.

LESSON 3

LABELING COLUMNS AND ROWS

Labels are titles or headings which identify your rows and columns. Labels can be words, numbers, or symbols. They can be used to title the rows or the columns and they can be placed anywhere in the work area.

To enter a label on the worksheet, you may use the following procedure:

1. If the label begins with a letter, simply type the word or words desired. They will first appear on the edit line. To correct any mistakes while on the edit line, use the ESC key to backspace and type the correction. Then RETURN.

2. If the label begins with a digit (0-9), a decimal, a math function (+, -, *, /), or a symbol (a @, #, etc.) you must first type a quotation mark ("). This will tell VISICALC to use what you type next as a label and not a value. For example: if you want to use the label 1984, you must type "1984. You do not want 1984 to be calculated along with other numbers in your work area.

Remember:

To LABEL: letters A-Z just type in on the edit line. ESC to backspace and correct. RETURN to enter.

numbers or symbols use the SHIFT ". . . type the numbers or symbols as a label. ESC to backspace and correct. RETURN to enter.

You may wish to use SHIFT and the " every time you enter a label.

The standard column width is 9 characters. If you wish to change the column width on your workwheet, consult the VisiCalc user's Manual

EXERCISE 2

LABELING COLUMNS AND ROWS

Insert your VisiCalc Disk.

A blank VisiCalc worksheet should now be showing on your screen. Note: VisiCalc does not have lower case letters. All VisiCalc letters are capital letters like THIS.

Please make the following keyboard entries in the order given:

1. Type the word LABEL into A1. Use ESC to backspace for corrections if necessary. Then press ➡ .
2. Type the word EXERCISE into B1. Press ⬅ (Go back to A1).
3. Press SPACE BAR (change cursor Direction Indicator to ! Press ➡ (Go to A2).
4. Press " (SHIFT and "keys) to tell VisiCalc to label is coming.
5. Press - nine times. (The standard VisiCalc column is nine characters wide.)
6. Press RETURN. Move your cursor to B2.
7. Put - - - - - - - - - in B2. (You'll need " first.)
8. Move your cursor to A4. (Leave row 3 blank.)
9. Type JOB # in A4. (Reminder: Use the ESCape key to backspace and make corrections if necessary.)
10. Type 2715 in B4 as a label. (Reminder: Press " before the 2. Otherwise, VisiCalc gets set to calculate a value.) Press RETURN after entering 2715.
11. Type 2716 in B5. Type 2717 in B6. (You can put blank spaces in after the " and before the 2 if you want to center the numbers in the column. Try it.)
12. Move to A6. (Try pressing the 7 key. Then type in A6 as you GO TO instruction.)
13. Type HOURS in A7.
14. Type $RATE in A8. (Reminder: You will need " first.)
15. Type - - - - - - - - - in A9, B9, C9, and D9. ("first.)

EXERCISE 2 (Continued)

16. Type INCOME in A10.

17. Type the following labels in the cells indicated.

A11	GAS
A12	SUPPLIES
A13	INSURANCE
A14	FEES PD
A15	FOOD
A16	- - - - - - - - - - (Repeat in B16-D16)
A17	EXPENSES
A18	(leave blank)
A19	NET JOB $

Your worksheet is now ready for values and formulas.

18. When you have finished the labeling exercise, power down to quit.

LESSON 4

ENTERING VALUES AND FORMULAS

Common values are sets of numbers like: 7555, 29.50, .666.

Common formulas you will likely use are ones which cause

+	Addition
-	Subtraction
*	Multiplication
/	Division

To enter a VALUE into a cell, place the cursor on the desired cell location and type the number which will first appear on the edit line. ESC to make any corrections. Then RETURN to enter.

When the first character you type for a cell is a number or a math symbol + - * / (# @ VISICALC is ready to receive a VALUE. This will appear on the prompt line. If you wish to use a LABEL instead, press ESC key twice to erase both a mistaken entry and the word VALUE.

To enter a FORMULA into a cell, you must use a + before a cell location to tell VISICALC that a VALUE is coming, otherwise it will be read as a LABEL. (For example: +B5*B6)

Formulas can be used to ask those "what if?" questions. If cell values are changed, VISICALC will automatically recalculate a formula using the new values. Here are some examples of formulas you can insert into any cell as you build your custom-made worksheet.

PLEASE REVIEW THE ORDER OF MATHEMATICAL CALCULATION BEFORE ATTEMPTING TO ENTER FORMULAS.

The order of mathematical calculation is as follows:

Parentheses	5(34)	Please
Exponents	4+4*5 2	Excuse
Multiplication	8-4*3	My
Division	8+12/5	Dear
Addition	7+6-8	Aunt
Subtraction	9-3+3	Sally

ENTERING VALUES AND FORMULAS (Continued)

NOW TRY TO VISUALIZE THESE FORMULAS ON THE VISICALC WORKSHEET:

+B3+B4	Add
+C5-C3	Subtract
+D15*A5	Multiply
+H11/G11	Divide
.55*E49	Multiply
+Z39*(T14T15-S91)	Combination (Which calculation comes first?)
4*A3/2	Combination (Which calculation comes first?)

There are endless possibilities. You must preceed the first letter in a formula with a + in order to alert VISICALC that a value for formula is coming. Then VISICALC will read it for calculation.

EXERCISE 3

ENTERING VALUES AND SIMPLE FORMULAS

Insert your VisiCalc disk.

A blank VisiCalc worksheet should now be showing on your screen.

Please make the following keyboard entries in the order given:

1. Type VALUES & into A1. Use ESC key to backspace for corrections, if necessary. Then press →.

2. Type FORMULAS into B1.

3. Move your cursor to A4. (Use SPACE BAR to change cursor Direction Indicator. Then use ← and → keys.)

4. Type the following values into the cells indicated.
   A4 400
   A5 500

5. Leave A6 blank.

6. Type the following formula into A7:
   +A4+A5

7. Move your cursor to C3. Type the same formula (+A4+A5) into cell C3. Press RETURN or ← or →.

8. Move your cursor to A9. Type the following formula into A9:
   +A4+A5+A7 Press RETURN. Look at your addition!

9. Move your cursor to A11. Type the following formula into A11:
   +A9/A7 Press RETURN. 1800/900=2. Now you are dividing!

10. Move your cursor to B7. Type the value .5 into B7. Press RETURN.

11. Move your cursor to D7. Type the following formula into D7:
    +A7*B7 Press RETURN. .5x900=450. Now you are multiplying!

12. Move your cursor to D9. Type the following formula into D9:
    +A9*.333 Press RETURN.

13. Move your cursor to E9. Type the following formula into E9.
    .333*A9 Press RETURN.

14. Move your cursor to C11. Type the following formula into C11:
    +C3-600 Press RETURN. Now you are subtracting!

15. Here's a final experiment. Move your cursor to C17. Divide the contents of C3 by the contents of C11. (Note: The VisiCalc symbol for divide is the / key.) Your answer should be 3.

EXERCISE 3 (Continued)

16. When you have finished experimenting with values and simple formulas, power down to quit.

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LESSON 5

WORKING WITH FUNCTIONS

If you wish to sum a range of cells in rows or columns, you will find that function formulas will calculate the sum much easier and faster. For example: If you want to use the following formula +B4+B5+B6+B7+B8+B9+B10 you may type it much quicker by using the function formula @SUM(B4 . . .B10). Both formulas will add the values in the cells from B4 to B10, but the function formula is much easier to enter.

A FUNCTION tells VISICALC you want to sum the values	A RANGE tells VISICALC the range of cells to be summed.

Use the following keystroke sequence for the function @SUM(B4 . . .B10)

1. Type @
2. Type SUM
3. Type (
4. Type the starting cell in the "range" you want to sum.
5. Type one period. VISICALC will automatically add two more periods.
6. Type in the ending cell of the "range" you want to sum.
7. Type)
8. Press RETURN.

Some other built-in functions are:

@MIN(cell . . .cell)	Gives you the minimum value in the range.
@MAX(cell . . .cell)	Gives you the maximum value in the range.
@AVERAGE(cell . . .cell)	Gives you the average value for the range.

EXERCISE 4

WORKING WITH FUNCTIONS

Insert your VisiCalc Disk.
A blank VisiCalc worksheet should now be showing on your screen.

Please make the following keyboard entries in the order given:

1. Type BUILT-IN into A1. Use ESC key to backspace for corrections, if necessary. Then press ➔.

2. Type FUNCTIONS into B1.

3. Move your cursor to B3. (Use SPACE BAR to change cursor Direction Indicator. Then use the ➔ key.)

4. Type the following values into the indicated cells:

B3	450
B4	612.5
B5	59.95
B6	608
B7	59.13

5. Move your cursor to B8. Type in ---------. (Reminder: Press " first to alert your computer that a LABEL is coming, rather then a VALUE.)

6. Move your cursor to A9. Type in TOTAL.

7. Move your cursor to B9. Type this function into B9: @SUM(B3 . . .B7) Then press RETURN. Now you have the sum! Note: When you press the period after B3, VisiCalc will automatically give you three dots (...)

8. Move your cursor to A11. Type the label AVERAGE.

9. Move your cursor to B11. Type this function into B11: @AVERAGE(B3...B7) Then Press RETURN. Now you have the average value in the range.

10. Move your cursor to A13. Type the label SMALLEST.

11. Move your cursor to B13. Type this function into B13: @MIN(B3...B7) Press RETURN. You now have identified the smallest number in the range B3 to B7, 59.13.

Note that in addition to SUM, AVERAGE, and MIN, VisiCalc has these other commonly used functions:
@MAX (range) chooses the largest value in the range
@COUNT(range)tells how many non-blank entries there are in the range

EXERCISE 4 (Continued)

12. Give these a try - watch for changes. Fr[illegible]n, go back to B7 and insert any new number. Watch the results. All function entries will be recalculated to reflect entry changes.

13. When you have finished experimenting with functions, power down to end session.

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LESSON 6

COMMANDS

Commands are instructions that you give to VisiCalc so that VisiCalc will take action on one or more cells of the worksheet. A list of the common commands follows:

/B Sets an entry to blank clears a cell. Doesn't take effect unless you follow it with an arrow or RETURN.

/C Clears the sheet, setting all entries to blank, resetting formats, window, titles, etc., but does not reset any remembered file name qualifiers. VisiCalc will wait for you to type a Y to confirm that you indeed want to clear the sheet.

/D Deletes the row (/DR) or column (/DC) on which the cursor lies.

/E Allows editing of the entry contents of any entry position by redisplaying it on the edit line. The arrow keys move an edit cue left and right. ESC erases the character to the left of the cue. New characters typed are inserted to the left of the cue.

/F Sets the display format of an entry to one of the following formats:

/FG	General
/FI	Integer
/F$	Dollars and cents
/FL	Left justified (used for values)
/FR	Right justified (used for labels)
/F*	Graph
/FD	Default. Resets any entry to use the global default format instead of an explicit format set with a/F command.

/G Global commands. These apply to the entire sheet or window.

/GC	Sets the column width.
/GO	Sets the order of recalculation to be down the columns or across the rows.
/GR	Sets recalculation to be automatic or manual.

/I Inserts a row (/IR) or a column (/IC) just above or to the left of the row or column on which the cursor lies.

/M Moves an entire row or column to a new position. Prompts you to move the cursor from the row or column which you want to move to the destination row or column just before which the entries moved should reappear. End with RETURN.

/P Print command. The /P command lets you output a VisiCalc sheet to a printer or disk drive. Output sent to a disk drive is saved as a text file which may be read by a BASIC program.

/R Replicate command. The /R command allows you to make copies of entries.

/S The /S commands let you save and load the current entries using a diskette, initalize diskettes, and exit from VisiCalc.

/T Sets a horizontal title area (/TH), a vertical title area (/TV), sets both a horizontal and vertical title area (/TB), or resets the window to have no title area (/TN)

/V Displays VisiCalc's version number on the prompt line. The version number will disappear as soon as you type something else.

/W Window control. Splits the screen into two windows at the cursor position (/WH for horizontal, /WV for vertical), or returns the screen to one window (/W1). Windows may be synchronized (/WS) or returned to unsynchronized (/WU).

/- Repeating label. Requests the contents of a label entry; end with an arrow or RETURN. The contents of the label will be repeated over and over to fill the entry, no matter what the column width.

LESSON 7

SAVING AND RETRIEVING

As you have probably realized by now, once you switch off the power to the computer, all of the data you have entered is lost. This is becasue the computer memory is electronic. Memory is, therefore, active only as long as the power is on. To save your work on a permanent record, you must save on a floppy disk. The following will discuss the VisiCalc commands which will cause your data to be sent from the computer memory onto your storage disk.

The following topics will be covered in this exercise:

1. Initialization - electronically preparing disks for holding data.
2. Saving and retrieving data on your disk.
3. Deleting data from your disk.

Initialization

Before VisiCalc can save any data on a blank disk, you must prepare the disk for data. You must initialize a new disk (straight from the box). Initialize only once. Do not initialize a disk with data already on it. If you do, all the data will be erased.

To initialize with a single disk drive:

1. Remove your VisiCalc from Drive 1.
2. Insert a new blank disk (don't forget to close the drive door).
3. Press RETURN.
4. Press the slash (/) key to get the Master Command Menu which will appear as follows: COMMAND: BCDEFGIMPRSTUW-
5. Press S (for Storage) from the Storage Menu which will appear as follows: STORAGE: L S D I Q #
6. Press I (for Initialize) from the Storage Menu. The prompt lines will read INIT DISK: TYPE RETURN TO ERASE DISK. If you have a single disk drive, type RETURN.

NOTE: If you are using a double disk drive--OMIT steps 1, 2, and 3. Keep the VisiCalc disk in drive 1. Insert a blank disk in drive 2. Follow steps 4 and 5. For step 6, type I but do not return. You must tell VisiCalc to initialize the disk in drive 2. When S6, D1 appears on the edit line, use the ESC key to change the drive number. D1 should be changed to D2. Then RETURN.

Saving and Retrieving

Once you have initialized your disk, you may save your worksheet on your diskette. The SAVE command creates a file for each worksheet saved. You must specify a unique file name for each worksheet file. A valid VisiCalc file name can have a length of 1 to 30 characters. The first character must be a letter. The rest of the name may be letters or numbers (avoid symbols and spaces). The VisiCalc program records the file name along with the address of the file's position on the diskette in the directory.

To save your data on a disk with a single disk drive:

1. Remove your VisiCalc disk from Drive 1.
2. Insert your initialized disk into Drive 1. RETURN.
3. Type slash (/) to get the Master Command Menu as follows: COMMAND: B C D E F G I M P R S T U W -
4. Type S (for Storage) and the Storage Menu will appear on the prompt line as follows: STORAGE: FILE FOR SAV!NG
5. Type S (for Save) from the Storage Menu. The prompt line will read: STORAGE: FILE FOR SAVING
6. Type the file name on the edit line. Then RETURN. (If you try to save with a file name that is already in the directory, you will see the prompt: FILE EXISTS: TYPE Y TO DELETE. If you type Y, the old file will be erased.

NOTE: If you are using a double disk drive--OMIT steps 1 and 2. Keep the VisiCalc disk in Drive 1. Insert your initialized disk in Drive 2. Follow steps 4 and 5. In step 6, when typing your file name, change the drive prefix from D1 to D2, using the ESC key. Then RETURN.

You will often want to up date (make changes to) a file (an existing set of data) stored on your disk rather than beginning a new file. The procedure for updating is almost identical to saving data for the first time.

To update an existing file:

1. Press slash (/) to get the Master Command Menu.
2. Press S to get the Storage Menu. STORAGE: L S D I Q #

3. Press S to get the prompt: STORAGE: FILE FOR SAVING.

4. Type the exact name under which the old file was originally saved. You can also press the right arrow repeatedly until the old file appears in the directory on the edit line and then press RETURN. You will see the file name on the prompt line.

5. VisiCalc will now give you a prompt: FILE EXISTS: PRESS Y TO REPLACE. If you want to replace your old existing file with the updated file, type Y. and RETURN.

If you want to retrieve a file from your saved files on your disk, you must load it back into the computer's memory. If you have a file in the memory, you must clear it prior to loading another file. Before clearing, you should make sure that you save your work.

To load a file back into computer memory:

1. Type slash (/) to get the Master Command Menu.

2. Type S to get the Storage Menu. STORAGE: L S D I Q #

3. Type L (for Load) from the Storage Menu to get the prompt: STORAGE: FILE TO LOAD

4. Type the file name or press the right arrow repeatedly until the name of the file appears in the directory on the edit line and press RETURN. The file name will then appear on the prompt line.

5. While the file is loading, the prompt: STORAGE: LOADING will appear. When loading is finished, the worksheet will appear in the window. You may now proceed to work on the worksheet.

If you want to erase a file from your disk that you no longer wish to use, you may delete the file. To delete a file:

1. Type slash (/) to get the Master Command Menu.

2. Type S to get the Storage Menu. STORAGE: L S D I Q #

3. Type D (for Delete) from the Storage Menu to get the prompt: STORAGE: FILE TO DELETE

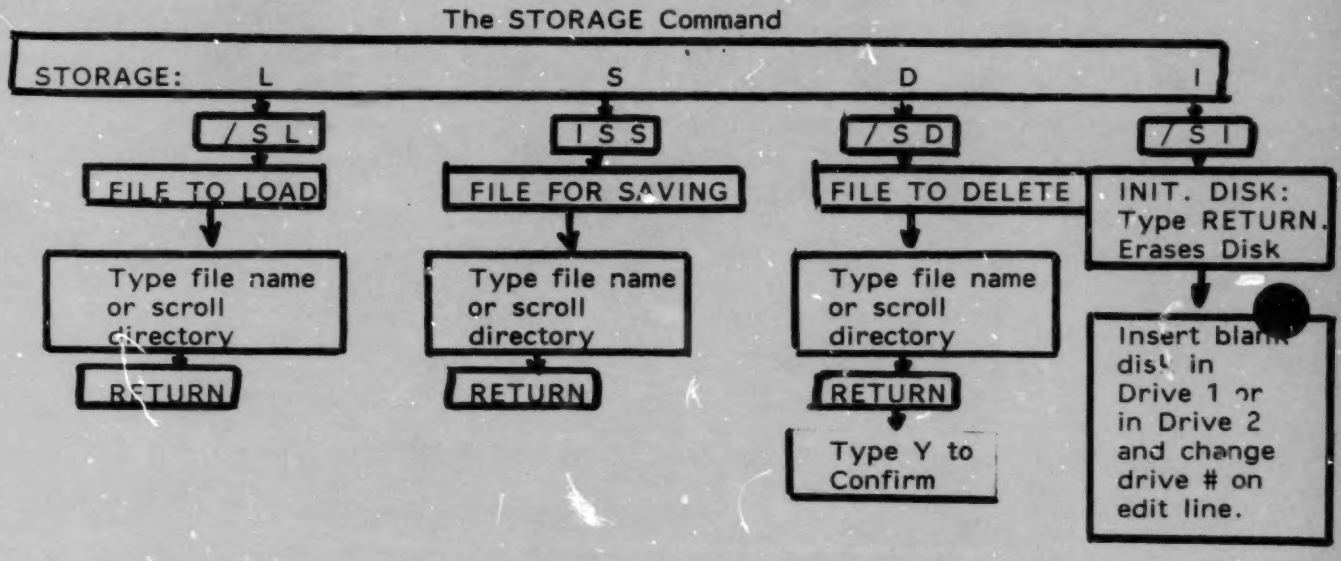
4. Type the file name or press the right arrow key repeatedly until the name of the file to be deleted appears. Then RETURN to get the file name to appear on the prompt line.

5. Press RETURN. The prompt line will be: DELETE FILE: TYPE Y TO CONFIRM.

6. Type Y to confirm. Any other key will cancel the command. The file will be removed from the disk but it will remain in the computer's memory until you turn off the computer.

7. If you change your mind while the file you deleted is still in the memory, go back to the / S S command sequence to save the file.

Review



NOTE: The Commands Q and # are not covered. If you wish an explanation of these commands, consult your VisiCalc Instructional Manual.

EXERCISE 5

Saving and Retrieving Your Work

Insert your VisiCalc Disk

A blank VisiCalc worksheet should now be showing on your screen. Please follow the steps below in the order given.

1. Remove the VisiCalc disk from the disk drive. Return it to its protective envelope.

2. Insert a blank disk into the drive. You will need to initialize your blank disk by doing the following:

   Press /
   Press S
   Press I
   Press RETURN
   When the drive stops whirring (red light off), your storage disk is initialized. This same procedure is followed to completely erase a disk.

4. Type the word STORAGE into A1. Use ESC to backspace and make corrections, if necessary. Press → .

5. Type the word EXERCISE: into B1.

6. Move your cursor to C1. Type RED FILE into C1.

7. Type the following values into the indicated cells.

B3	1500
C3	1600
D3	1750

8. Now save the Red File on your storage disk:

   Press / to get the master COMMAND
   Press S to get the STORAGE subset
   Press S to get FILE FOR SAVING

9. Type in the words RED FILE on your VisiCalc edit line. Then press RETURN.

   NOTE: Your disk drive will now whirr as the Red File data in your computer's memory is transferred to the storage disk. The Red File will also remain on your screen.

10. Now, please clear your screen by using the CLEAR command:

    Press /
    Press C
    Press Y to Confirm

EXERCISE 5 (Continued)

11. Type the following labels and values into the indicated cells:

A1	STORAGE
B1	EXERCISE:
C1	PART 2
A3	BLUE FILE
A8	TOTAL
B4	500
B5	1012
B6	199
B7	- - - - - - - - - - (Reminder: Press " first.)
B8	+B4+B5+B6
Press	RETURN

12. Now, save the Blue File on your storage disk:

    Press /
    Press S
    Press S
    Type BLUE FILE on your edit line
    Press RETURN

13. Now the big step. Remove your storage disk from the disk drive and turn the power down. (Switch off Computer)

14. Insert your VisiCalc disk into the disk drive and turn the power ON. You should get a blank VisiCalc worksheet on your screen. Now, you are ready to load the Blue File (or any other file) from a storage disk.

15. Remove the VisiCalc disk. Insert the storage disk into the disk drive.

16. Find the Blue File on the storage disk.

    Press /
    Press S
    Press L (L for Load)
    Press - repeatedly until you see the file name (BLUE FILE) on the edit line
    Press RETURN

17. There you have it! The Blue File should now be showing on your screen. You can work on it as long as you want, changing numbers, adding new material, etc. When you are ready to save the updated Blue File worksheet, you can once again save it. But this time you will save it by merely replacing the old, now out-dated Blue File already on the storage disk. Try it. Change a few numbers and labels on your Blue File worksheet. Then:

    Press /
    Press S
    Press S
    Press - repeatedly until you see the old file name (BLUE FILE) on the edit line
    Press RETURN
    Press Y to confirm that you want to replace the old file with the new one

18. When you have finished experimenting with saving and retrieving your worksheets, you may want to erase your storage disk. Press /S1 RETURN to completely clear the disk, i.e., erase all files on it. Then, after the drive has stopped, turn the power switch OFF.

LESSON 8

PRINTING

You may wish to print your worksheet onto paper (hard copy). You may print an entire file or any section of the file that you desire. Make sure that you have a printer that is properly connected to your Apple computer so that the file in the computer memory can be sent to your printer and the printer can print it.

The Print command exctly reproduces a rectangle of information from your worksheet just as you see it on the screen.

To print, you will need to do the following:

1. Mentally identify the cell locations.

   - the cell in the UPPER LEFT corner of the part of the worksheet you want to print
   - the cell in the LOWER RIGHT corner of the part of the worksheet you want to print

2. Give printing instructions to VisiCalc.

Follow the following procedure to print:

1. Move the cursor to the UPPER LEFT corner of the portion you want printed. Use the arrow keys or SHIFT cell# for a direct move.

2. Type slash (/) to get the Master Command Menu. COMMAND: B C D E F G I M P R S U W -

3. Type P (for Print) to get the Print Menu. The menu will appear on the prompt line: PRINT: FILE, PRINTER, #(OF SLOT)

4. Type P if the printer is in slot 1, or type slot number. The prompt line will be: PRINT: LOWER RIGHT, "SETUP, _____, &

5. Type the cell location in the LOWER RIGHT corner of the portion you want printed.

6. Press RETURN. The printout should begin.

NOTE: You can stop a printout by typing CTRL C.

EXERCISE 6

Printing Your Work

A blank VisiCalc worksheet should now be showing on your screen. In addition, a printer should be attached to your computer, ready to print.

Please make the following keyboard entries in the order given:

1. Type PRINTING into A1. Use ESC key to backspace for corrections, if necessary. Then press - .

2. Type EXERCISE into B1.

3. Type the following labels into the indicated cells:
   A15 MIDDLE
   A16 NEXT LINE
   A29 AT THE
   A30 BOTTON

4. Move your cursor to H1. Type the word UPPER into H1.

5. Move your cursor to H2. Type the word RIGHT into H2.

6. Type the following labels into the indicated cells:
   H15 MIDDLE
   H16 NEXT LINE
   H29 LOWER
   H30 RIGHT

7. Now identify the cell location of the lower right corner you want to print. Assuming that your printer will print 80 columns, the farthest to the right of column A you can print is column H. In this exercise, use H30 as your lower right corner.

   (VisiCalc's standard column width is 9 characters. 9 x A,B, C...H = 72 characters.)

8. Move your cursor to the upper left corner of the portion of the worksheet you want to print. (Go to A1 for this exercise.)

9. You are now ready to print. Do this:
   Press / to get the master COMMAND
   Press P to get the PRINT subset
   Press P again (or enter the slot number of the printer)
   Type H30 to enter the lower right corner location.
   Press RETURN.

NOTE: You can stop your printer at any time by typing CTRL C on your computer's keyboard.

EXERCISE 6 (Continued)

Now suppose your worksheet actually contained material all the way to column T. Pretend T30 was the lower right corner of your worksheet. If such were the case, you would have to print your worksheet in sections.

Now let's try it.

10. Type the following labels into the indicated cells:

I1	SECOND
I2	CURSOR
I3	HERE
I15	MIDDLE
I30	BOTTOM #2
P1	SECOND
P2	UPPER
P3	RIGHT
P15	MIDDLE
P29	LOWER
P30	RIGHT

11. Print the above. (Reminder: Move the cursor to I1 before you start the printing commands sequence in Step 9. Substitute P30 for H30.)

12. Now type these labels into the indicated cells:

Q1	THIRD
Q2	CURSOR
Q3	HERE
Q30	BOTTOM #3
T1	THIRD
T2	UPPER
T3	RIGHT
T15	MIDDLE
T29	LOWER
T30	FINISH!

13. Print the above.

    First Worksheet A1 - H 30
    Second worksheet I1 - P 30
    Third worksheet Q1 - T 30

14. You can now tape the three printed pages together for a complete copy of your worksheet.

15. When you have finished experimenting with printing, power down to end session.

LESSON 9

REPLICATING: THE CONCEPT AND THE PROCESS

As you begin to build custom-made worksheets, there will be occasions when you will want to repeat or duplicate a label, value, or formula. In VisiCalc, the command "replicate" is used for this activity. "Replicate" is a combination of REPeat and dupLICATE. The replicate command can save you a lot of time and typing as you format your worksheets.

Replicating can be used to copy or duplicate values, labels, formulas or symbols from one cell (or group of cells) to any other cell (or group of cells). When replicating the data in a cell or a group of cells, you must:

1. Specify the

   SOURCE RANGE — The cell or cells from which data is to be moved, and the

   TARGET RANGE — The cell or cells into which the replication is to be made.

2. In the case of formulas, decide whether each variable is to be moved with NO CHANGE or RELATIVE to its new home.

THE CONCEPT

The SOURCE RANGE is the cell or cells holding values, labels, or formulas that you wish to replicate. These values, labels, or formulas can be from a single source (cell) or a source range (several adjacent cells).

The TARGET RANGE is the cell or cells in which to place the source data. The target range can be a single cell or a range of adjacent cells.

EXAMPLE:

(B3...B3) : (C3...C3) (single cell)

SOURCE RANGE TO TARGET RANGE

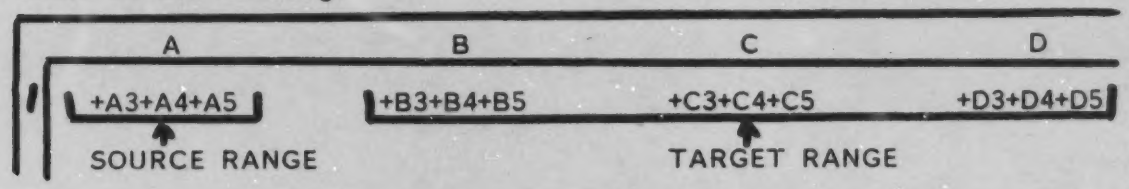
(B3...B6) : (C3...D3) (several a adjacent cells)

SOURCE RANGE TO TRAGET RANGE

When replicating formulas, you will have to decide whether each of the variables in the formula being replicated is to be moved with NO CHANGE or moved so it is RELATIVE to those new cell locations.

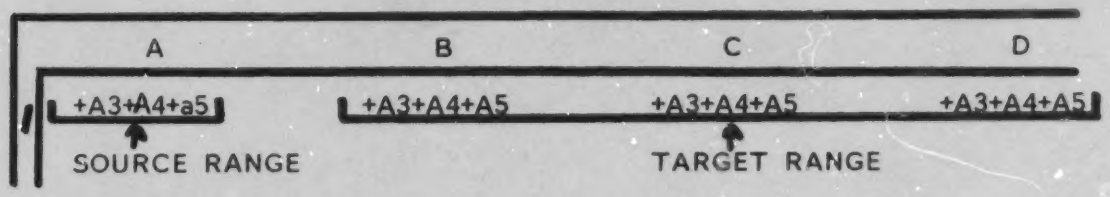
Sample Formula being replicated: +A3+A4+A5
Variables

Suppose you want the formula to be moved RELATIVE in its entirety from cell A1 to the target range B1...D1. Pressing R (for Relative) for each variable would do the following:



These formulas are "buried" in each cell and will show in the display area when the cursor is on the cell.

If you wanted to move the formula in its entirety with NO CHANGE you would press N (No Change) for each variable and the following would occur:



Note that the formula has moved with no change.

THE PROCESS

To replicate follow this procedure:

1. Move your cursor to the starting point of your SOURCE RANGE.
2. Press slash (/) to get the Master Command Menu.
3. Press R (for Replicate) and the prompt line will be:
   REPLICATE: SOURCE RANGE OR RETURN.

4. The edit line will contain the cell location of your cursor (the first half of the source range. (Example: B2) Type a period and then the end point of your SOURCE RANGE. (Example: B2...B2). RETURN.

5. The prompt will be: REPLICATE: TARGET RANGE. Type the target range by typing the cell locations of your choice (Example: C2...D2). RETURN.

6. If you have a formula, each variable of the formula will be highlighted one at a time. The prompt will be N=NO CHANGE or R+RELATIVE. Type either N or R for each variable.

7. Your labels, values, or formulas should now be replicated.

Example:

	A	B	C	D
1	REP EX			
2	MONTHS	JANUARY	FEBRUARY	MARCH
3		1982	1982	1982
4	==========	==========	==========	==========
5	SALARIES:			
6	JANE	3000	3000	3000
7	JOE	2450	2450	2450
8	JOHN	1700	1700	1700
9	----------	----------	----------	----------
10	TOTALS	7150	7150	7150

In the above example, there are five places in which replicating can save time.

1. The year 1982. Replicate from the SOURCE RANGE (B3...B3) to label the TARGET RANGE (C3...D3) since the source range is a single cell. This cell location name is used for both the beginning and ending of the source range.

2. The dashed lines (====) beneath the 1982's. To replicate the label (====) the SOURCE RANGE would be B4...B4 and the TARGET RANGE is B4...D4 Note that you can move to a longer target such as B4...Z4 if necessary.

3. Since the salaries do not change from month to month, you could replicate the range B6, B7, B8. The SOURCE RANGE is B6...B8 and the TARGET RANGE is C6...D6. NOTE: when replicating a range of columns, the target range consists only of the top cell of the columns which are the target range C6...D6 in this instance.

4. Replicate the dashed line (----) below JOHN, use the same procedure as the dashed lines above.

5. Since the salaries do not change from month to month, the totals are also the same. To replicate the TOTALS, you must replicate the formula that is typed in B10 (either +B6+B7+B8 or @SUM(B6 ...B8). The SOURCE RANGE would be B10...B10 and the TARGET RANGE would be C10...D10. You will also have to answer the prompt N=NO CHANGE OR R=RELATIVE. You will want to answer R because the totals are summed relative to the amounts in their columns. Even though they are the same for each month, if there was a change in salary for a given month, you would want the formula to sum the totals in the column for that month.

EXERCISE 7

REPEATING LABELS, VALUES, AND FORMULAS

A blank VisiCalc worksheet should now be showing on your screen.

Please make the following keyboard entries in the order given:

1. Type REPLICATING EXAMPLE: SALES BUDGET into A1, B1, C1, and D1. Use the ESC key to backspace for corrections, if necessary. (Reminder: The standard VisiCalc column is nine characters wide.)

2. Move your cursor to A3. Type the label MONTHS into A3.

3. Type the following labels into the indicated cells:

A4	---------("required first)
A5	SALES
A6	LESS:COST
A7	---------
A8	GR MARGIN
A10	MRKTG EXP
A11	G & A EXP
A12	OTHER EXP
A13	========= ("required)
A14	OP.PROFIT

4. Type the following labels into the indicated cells:

B2	1982 ("required)
B3	JANUARY
C3	FEBRUARY
D3	MARCH
E3	TOTAL QTR

5. Type the following values and formulas into the indicated cells:

B5	20000
B6	.40*B5
B8	+B5 - B6
B10	4000
B11	2000
B12	500
B14	+B8 - @SUM(B10.B12)
E5	@SUM(B5.D5)

6. Type the following replicate commands into the cells indicated:

Place Cursor	Type or Press
B2	/R B2.B2: (R)* C2.E2 (R)
E5	/R E5.E5: (R) E6.E13 (R) RR
A4	/R A4.A4: (R) B4.E4 (R)
B6	/R B6.B6: (R) C6.D6 (R)
A7	/R A7.A7: (R) B7.E7 (R)
B8	/R B8.B8: (R) C8.D8 (R) RR
B10	/R B10.B12: (R) C10.D10 (R)
A13	/R A13.A13: (R) B13.E13 (R)
B14	/R B14.B14: (R) C14.E14 (R) RRR

NOTE: In B10 above, you replicated a range of cells:

7. Type the following values into the indicated cells.

C5	26000
D5	31500

8. Move cursor to column E to see Total Quarter.

9. If time permits try changing values. Power down to quit ending session.

* RETURN

LESSONS AND EXERCISES

FOR

LOTUS 1-2-3

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PROCEDURE FOR LOTUS 1-2-3

Instruction is presented for the following topics. It is recommended that you take these in order.

Lesson	A	Getting Started 1. Keyboard 2. Display 3. Terms
Lesson	B	Moving the Cursor
Lesson	C	Entering numbers, formulas and labels
Lesson	D	Working with Formulas using @Functions
Lesson	E	Using Commands to Save and Retrieve Files
Lesson	G	Copy Command

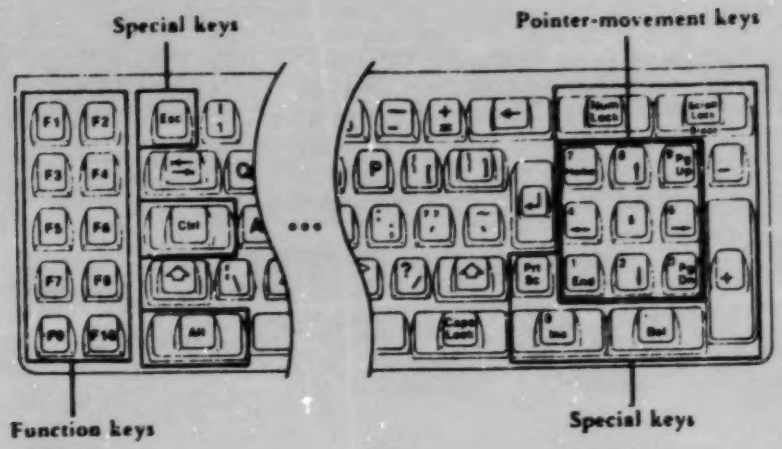
WHAT YOU NEED

1. IBM Personal Computer (or other computer able to handle Lotus 1-2-3
2. A TV Set or Video Monitor
3. A Printer
4. Lotus 1-2-3 Software (containing User's Manual, 5 program disks, and Quick Reference Booklets)
5. Initialized disk for each student

LESSON A

The IBM PC KEYBOARD--SPECIAL KEYS

The keyboard includes four major parts:



1. Typewriter Section. This section acts just like a typewriter. The letter keys are in their usual places. Holding the Shift key down and pressing a letter key will give you a capital. Holding the Shift key down and pressing a number will give you a symbol. CAPS LOCK will give you all capital letters, but you still have to use the Shift key to get symbols on the number keys. You will use the typewriter keys to enter numbers.

2. Pointer Movement Keys. These keys are located on the number pad on the right side of your keyboard. If the NUM LOCK key is on you may use the number pad to produce numbers. With NUM LOCK off, you can use four keys on the number pad to move your cursor to a particular cell, to a menu choice, etc. You will find it easier to leave NUM LOCK off and enter numbers with typewriter keys.

3. Function Keys. F1 through F10 perform specific 1-2-3 operations. These keys are described later in this manual.

4. Special Keys. You should become familiar with the keys that are pictured in the diagram and explained below.

BEST COPY AVAILABLE

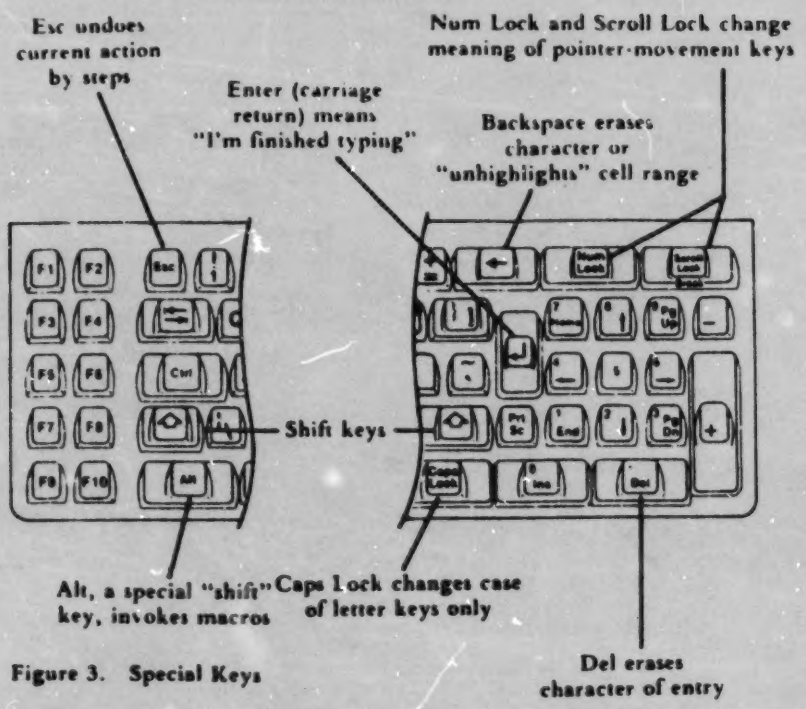
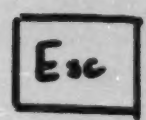
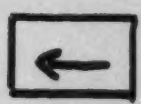

Esc undoes current action by steps
Enter (carriage return) means "I'm finished typing"
Num Lock and Scroll Lock change meaning of pointer-movement keys
Backspace erases character or "unhighlights" cell range
Shift keys
Alt, a special "shift" key, invokes macros
Caps Lock changes case of letter keys only
Del erases character of entry

Figure 3. Special Keys

(Enter) The Enter key performs a function similar to that of the "carriage return" key on electric typewriters. By pressing the Enter key, you are telling the program that you are finished typing an entry and now it may enter it into memory.



(Escape) The Escape key is the opposite of the Enter key. It tells the program to "go back a step." Pressing the Escape key while typing an entry on the edit line will erase the entire entry. Pressing ESC will also "undo" a mistake in a command before the command is executed.



(Backspace) In typing situations, means "erase the last character I typed." Pressing the backspace key while typing an entry on the edit line will erase only the last character typed.

(Shift) Changes the meaning of the typewriter section (lower-case to upper case).

(Alternate) Changes the meaning of letter keys, invoking key-stroke sequences you have assigned to these keys.

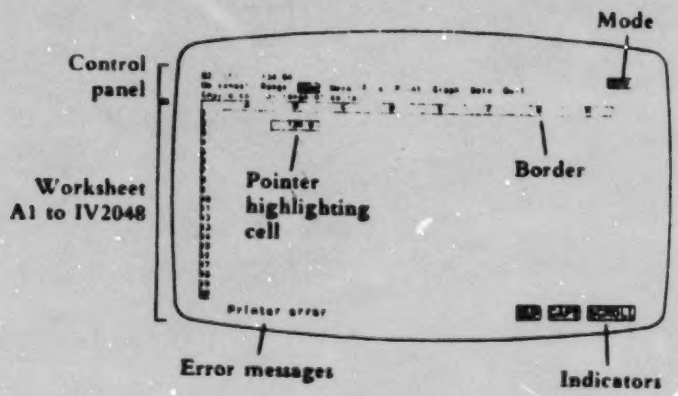
(Num Lock) Changes the meaning of the pointer movement keys.

(Delete) In typing situations, means "erase the character I'm pointing at."

(Print Screen) When used with Shift, makes an exact printed copy of what is currently on the display screen.

THE DISPLAY

The 1-2-3 on-screen display has three parts: The Control Panel (at the top), The Worksheet (which takes up most of the screen), and separating the two is a Border showing the column letters and row numbers of the section of the worksheet you are viewing.



1. The Control Panel. You will note that the control panel has three lines. The first line contains information about the location (address) of the current cursor position and the contents of the cursor position (cell). The second line displays the characters of your entries as you type and edit them, menu items, or "prompts" asking for additional command specifications. The third line displays "quick summaries" or explanations of the menu while you are selecting a command to perform.

2. The Border Area. The horizontal border area contains letters identifying each column. It starts with A through Z, continues with AA through AZ, then BA through Bz, and so on up to IV for a total of 256 columns. The vertical border on the let side contains row numbers 1 through 2048. No matter where you are in the worksheet, the border will show the appropriate column letters and row numbers.

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3. The Worksheet. The worksheet is similar to a financial ledger sheet--it's ruled into rows and columns. Each of the spaces in the worksheet (called "cells") can store a piece of information: a number, letters, words, or an instruction to calculate a value. Each entry you type is placed in a "cell," each with its own "address" such as A23, describing its column and row location. Since the entire worksheet is too large to fit on your monitor screen, 1-2-3 displays only a section of it at a time. Think of it as looking through a "window"--you can move this window to show any part of the screen you wish to see.

KEY TERMS YOU SHOULD KNOW

1. Cell or coordinate: The place at which a row and column intersect. Each cell has storage capacity so you can place a LABEL (such as APRIL, COST, PRICE) or a VALUE (such as 267.55, 10, 123), or an arithmetic FORMULA (such as .55*B5).

2. Cursor: The highlighted block in the work area that gives you access to any cell on the electronic worksheet. By locating the cursor over the cell, you can enter, change, or delete information in any cell.

3. Label: Any entry which starts with a letter.

4. Value: Any number or formula entered on the worksheet.

5. Formula: An instruction for the program to calculate a number.

6. Range: A cell or rectangular group of cells on the worksheet. A range may be defined by naming the coordinates to be included.

7. Function: Built in "formulas" to perform particular calculations. For example: @SUM replacing B1+B2+B3. Functions are always preceded by @.

8. Function Keys: The ten function keys located on the left side of the keyboard having special functions assigned to them in the 1-2-3 program.

9. Edit line: The second line of the control panel which displays the characters of your entries as you type and edit them while in the READY mode.

10. Menu: A series of command choices which appear in the control panel after a slash (/) has been typed. You will be in MENU mode.

LESSON B

MOVING ONE CELL AT A TIME

You can use the arrow keys on the pointer-movement keypad to move the cell pointed one cell at a time. A worksheet is composed of "cells" organized into rows and columns. You can think of the cells as being mailboxes or cubby-holes. Each cell can hold a single piece of information called an entry. A highlight called a "cell pointer" shows what cell you are at. To move the pointer to a cell address, press the → key to move across to the right, the ← key to move across to the left, the ↑ key to move up, or the ↓ key to move down.

NOTE: Be sure that the keyboard's NUM LOCK facility is turned off before you use the arrow keys.

Don't worry about the edges of the display screen. You can move the pointer off the worksheet by continuing to press the arrow keys. There is more to the worksheet than meets the eye. When you move the cell pointer 1-2-3 adjusts (scrolls) the window to reveal another part of the worksheet.

MOVING THE CURSOR IN BIGGER JUMPS

In a new worksheet the window is in the upper left corner. You can move the window so that you see, for example, columns S through Y or rows 41 through 60. The return to the upper left cell of the worksheet (A1), in one quick move, just press the HOME key. If you want to jump to the end of your worksheet in one quick move, just press the END with a ↓ arrow to see the bottom edge, or use the END key with → arrow to see the right edge across. Depending on where you are on the worksheet, you can use the END key with one of the arrows to get to any edge of the worksheet.

For direct move from one cell to any other cell, just press one of the Function keys (F5 (Go To) key and enter the address of the cell you want to move to. For example, if you are at C3 and you want to move to S12, press F5 and then type S12. Your cursor will be in cell S12.

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EXERCISE 1

MOVING THE CURSOR ON THE WORKSHEET

1. Insert your Lotus 1-2-3 Program Disk. Press Enter key for Copyright Information to disappear.

2. A blank worksheet should now appear on your screen. The cursor is in cell address A1.

3. Use ← ↑ → ↓ keys to get to the following cell addresses:

   Move → to H1
   Move ← to A1
   Move ↓ to A12
   Move ↑ to A1
   Move → to P1
   Move ↓ to P25

4. Press HOME key to return to A1.

5. Press END and ↓ to see the bottom edge of the worksheet.

6. Press END and ↑ to see the top edge of the worksheet.

7. Press END and → to see the right edge of the worksheet.

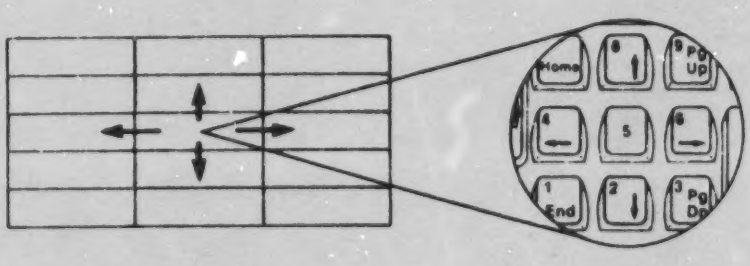
8. Press END and ← to see the left edge of the worksheet. Press HOME key to return to A1 at any time.

9. Use F5 (one of the function keys) to make a direct move from one cell to another cell on the worksheet. Try the following:

   Move to Z100 - Press F5 and type Z100
   Move to L50 - Press F5 and type L50
   Move to BA12 - Press F5 and type BA12

10. Press HOME key to return to A1. You may try to move the cursor in any direction you wish--either one cell at a time or in a direct move.

11. When you have finished experimenting with your cursor, power down to end the session.



Using the Arrow Keys

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LESSON C

ENTERING NUMBERS, FORMULAS, AND LABELS

To create a worksheet:

1. Move the cell pointer to a particular cell.
2. Type an entry (either a number, value, or formula) to be stored in that cell. You will see a blinking cursor on the edit line--the second line of the Control Panel.
3. End the entry by pressing the ↵ key. 1-2-3 does not store an entry in the cell until you press the ↵ key.

There are three types of entries you can create: numbers, formulas, and labels.

ENTERING NUMBERS AND FORMULAS

If you start an entry with one of the following characters, 1-2-3 will think that you're entering a number or a formula.

0 1 2 3 4 5 6 7 8 9 0 + - . (@ # $

After you type the first charcter, you will see the READY mode indicator in the upper right corner change to VALUE.

Rules for entering numbers:

1. A number may begin with a digit (0 ... 9), a plus or minus sign, a period, or a $.
2. A number may end with % to indicate percent. This character divides the preceding number by 100.
3. A number may have at most one decimal point.
4. You may <u>not</u> use any commas or spaces when entering a number.

A formula may be entered into any cell to calculate a number. A formula, like a number, must begin with a numeric value or one of the symbols above. For example: Suppose you want to add a column of numbers. We can accomplish this by telling 1-2-3 which cell addresses to add up: +A11+A12+A13+A14 ↵ . 1-2-3 automatically uses the numbers stored in those addresses whenever it calculates the formula. You may enter a formula either by typing it on the edit line or by pointing.

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To enter a formula using the typing method:

1. Move pointer to the cell where the total is to be typed.
2. Type + and the cell location for each cell location whose values are to be used in the formula.
3. Press ↵

To enter a formula using the pointing method: (See figure below)

1. Move the pointer to the desired cell location. This is where you wish your formula to be "buried" called the formula cell.
2. To enter a formula to add a group of numbers, you must point to each of the referenced cells--the cells whose values are used in the formula.

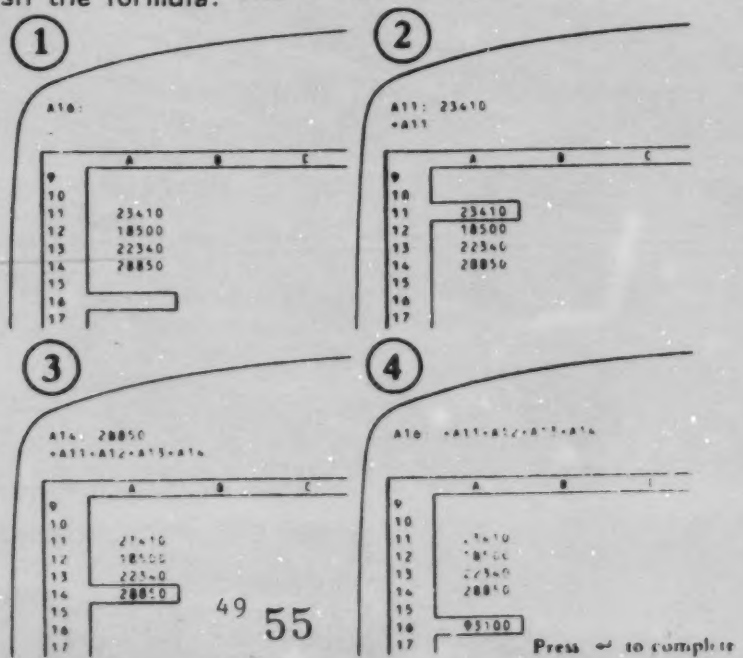
   Start with a + to indicate addition.

   Move the cell pointer to the first cell to be added and type a + to lock the address into the formula. (If a different math function is desired, just type the symbol + - * / to indicate the operation to be performed.) The pointer returns to the formula cell.

   Move the cell pointer to the next cell to be added in the formula and type a + to lock the address into the formula. Do this for each referenced cell.

   Move the cell pointer to the next cell to be added in the formula and type a + to lock the address into the formula. Do this for each referenced cell.

   Press ↵ to finish the formula.


Press "+" then move pointer to first value to be added
1
2
3
4
When you press "+" again pointer returns to A16 Move it to the next cell to be added And so on, and so on.
Press ↵ to complete the formula

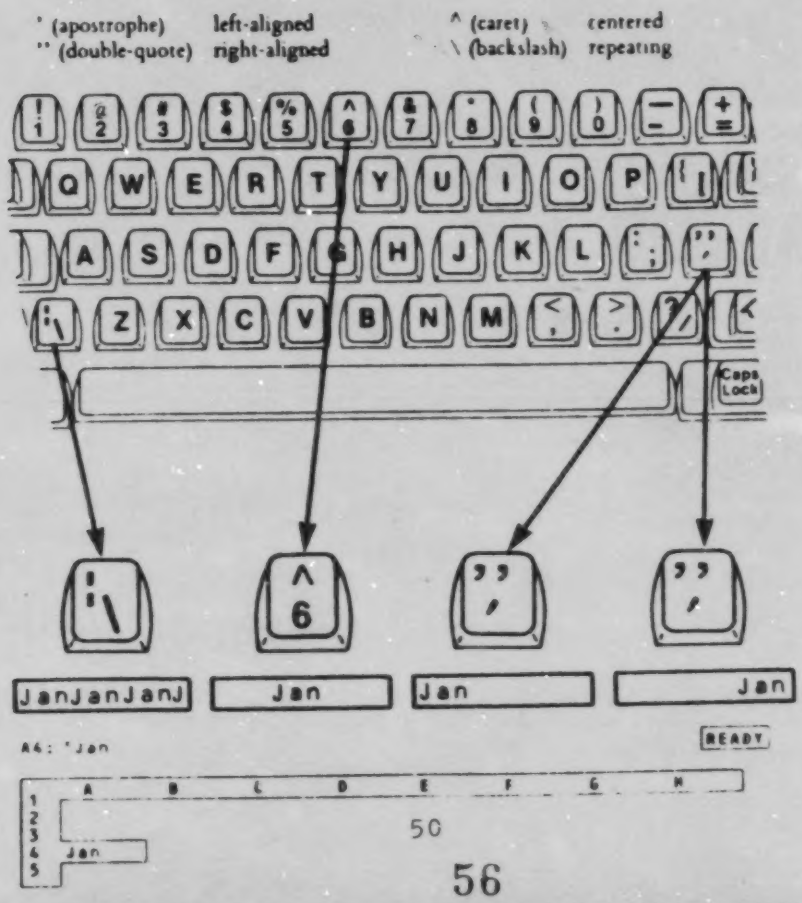
Entering a Formula by "Pointing"

By doing this, you will have entered your formula. From here on, any time you change the value in a cell, the same formula will automatically recalculate and display the new answer. For example: suppose you want to change the value in cell A14 to 20000. The answer will be changed automatically because 1-2-3 recalculates the formula with the new value.

ENTERING LABELS

If the first character you type is not among those number-indicators listed in the previous section, 1-2-3 will enter a label. A label is merely for display purposes --it is not intended to be calculated.

To enter a label, you must first enter a label-prefix character. These label-prefix characters are displayed below:



If you make a mistake while typing an entry you may do one of the following:

ESC	Cancel the entry and return to READY mode.
←	Backspace to delete the last character typed.
HOME	Moves the cursor to the first character of the entry.

if you notice a mistake after you pressed the Entry key, move the cell pointer to the cell, type the correct entry over the error, and press Enter.

To enter a label:

1. Move pointer to the cell where the label is to appear.

2. Start the label with a label-prefix key

'	to align the label to the left
"	to align the label to the right
^	to center the label

and type a Capital letter. The letter appears in the Control Panel and the READY indicator changes to LABEL.

3. Type the rest of the label and ↵ to finish. You may type anything you want as a label. If you wish a number to be a label, make sure that you type a label-prefix before the number.

EXERCISE 2

ENTERING NUMBERS, FORMULAS, AND LABELS

1. Insert your Lotus 1-2-3 Program Disk. Press Enter key for Copyright information to disappear.

2. A blank worksheet should now appear on your screen. The cursor is a cell address A1.

3. Enter each of the following labels using the following procedure: Move the cursor to cell address. Type label. ESC to cancel entry or backspace to correct typing mistakes. Press Enter key.

   Type INCOME in A1
   Type MONTHLY in A2
   Type EXPENSES in C1
   Type GAS in C2
   Type SUPPLIES in C3
   Type INSURANCE in C4
   Type RENT in C5
   Type FOOD in C6
   Type TOTAL EXP in A8
   Type NET INCOME in A10

   Reminder: You must use a label-prefix character before typing a label. For this exercise, use the apostrophe (') to align the labels to the left.

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4. Enter the following values using the following procedure: Move cursor to cell address. Type the value. Press Enter key.

   Type 900 in B2
   Type 50 in D2
   Type 75 in D3
   Type 100 in D4
   Type 225 in D5
   Type 200 in D6

5. Now that you have typed your labels and values, you have your worksheet set up. Now we are going to enter some formulas so that 1-2-3 can calculate for us. First, we want to add up our expenses and put the total in B8.

   To type a formula, adding the values in cells D2 through D6, you may use either the typing method or the pointing method.

   Typing method: Move cursor to B8 (the formula cell).
   Type +D2+D3+D4+D5+D6 on the second line of the Control Panel.
   Press Enter key.

   Pointing method: Move cursor to B8 (the formula cell).
   Type + and then move pointer to D3,
   Type + and then move pointer to D4,
   Type + and then move pointer to D5,
   Type + and then move pointer to D6.
   Press Enter key.

In either method, the formula is "buried" in the formula cell. The answer will be displayed on the screen.

EXERCISE 2 (Continued)

6. Now we need a formula to claculate NET INCOME. To get our NET INCOME, we must subtract EXPENSES from INCOME. (INCOME - EXPENSES = NET INCOME. To enter the formula, use either the typing method or the pointing method.

   Typing method: Move cursor to B10 (formula cell). Type +B2-B8 on the second line in the Control Panel. (NOTE: You must begin the formula with a + to tell 1-2-3 that a formula is coming.) Press the Enter key.

   Pointing method: Move cursor to B10 (formula cell). Type + and then move pointer to B2 Type - and then move pointer to B8 Press Enter key.

The formula is "buried" in B10. Your NET INCOME value should be displayed.

7. To further experiment with formulas, lets add some labels to your worksheet. Type the following labels (use apostrophe (') to left align).

   Type ANNUAL NET INCOME in A12
   Type QUARTERLY NET INCOME in A14

8. To get annual net income, you must multiply the monthly net income by 12 (no. of months in a year). To enter this formula using the pointer method:

   Move cursor to B12 (formula cell).
   Type + and then move pointer to B10
   Type *12
   Press Enter key.

   Your annual net income should be displayed in B12.

9. To get quarterly net income, you can divide the yearly net income by 4. To enter this formula using the pointer method:

   Move cursor to B14 (formula cell).
   Type + and then move pointer to B12
   Type /4
   Press Enter key.

   Your quarterly net income should be displayed in B14.

10. You are now finished with this exercise. Power down to end the session.

LESSON D

WORKING WITH FORMULAS USING @ FUNCTIONS

We've discussed the fact that you can indicate numbers for 1-2-3 to process in a formula either by typing or by pointing to cells. Now let's concentrate on the other half of the story--telling 1-2-3 what to do with the numbers.

In Lesson C, we added a group of cells using, for example, +A11+A12+A13+A14. We also subtracted using the - symbol, multiplied using the * symbol, and divided using the / symbol. In order to combine these operations into a formula, you must know the order of mathematical calculation. 1-2-3 will perform mathematical calculations in the following order:

1.	Parentheses	5(3+4)	Please
2.	Exponents	4+4*5 2	Excuse
3.	Multiplication	8-4*3	My
4.	Division	8+12/5	Dear
5.	Addition	7+6-8	Aunt
6.	Subtraction	9-3+3	Sally

NOW TRY TO VISUALIZE THESE FORMULAS ON THE LOTUS 1-2-3 WORKSHEET:

+B3+B4	Add
+C5-C3	Subtract
+D15*A5	Multiply
+H11/G11	Divide
.55*B49	Multiply
+Z99*(T14+T15-S91)	Combination (which calculation comes first?)
4*A3/@	Combination (which calculation comes first?)

These are endless possibilities.

FUNCTIONS

A function is a formula within a formula. Using function formulas can be complicated, so we will deal with only the simple functions here.

A function basically enables you to enter formulas faster and easier. For example, the formula +B3+B4+B5+B6 could be typed as a function-- @SUM(B3..B6). The result in both cases will be the same. 1-2-3 will add the values in cells B3 through B6.

To use a function formula, you type the @ symbol followed by the function name. Then you must supply one or more values called "arguments" and 1-2-3 calculates the result. Type the arguments in parentheses (B3,B4,B5,B6) or specify a range of cells (B3..B6). If you specify a range of cells, you must type at least one period between cell addresses. 1-2-3 will automatically display two periods.

Some examples of the most common functions are:

@SUM(list)	Sum of values in list of agruments or range of cells.
@AVG(list)	Average the values in the list of arguments or range of cells.
@MIN(list)	Minimum value in list of arguments or range of cells.
@MAX(list)	Maximum value in list of arguments or range of cells.
@COUNT(list)	Count the number of argument values in list or range of cells.

list: any number of arguments, separated by commas. May be a number, formula, cell address, range specification, or range name.

EXERCISE 3

WORKING WITH FORMULAS USING @ FUNCTIONS

1. Insert your Lotus 1-2-3 Program Disk. Press Enter key for copyright information to disappear. Insert your initialized disk in Drive B.

2. A blank worksheet should now appear on your screen. The cursor is in cell address A1.

3. Type the label BUILT-IN in A1 and the label FUNCTIONS in B1.

4. Type the following values into the cells indicated:

B3	450
B4	612.5
B5	59.95
B6	608
B7	59.13

5. Move your cursor to B8. Type the label ---------. (Reminder: Press the " first to right justify).

6. Go to A9. Type the label TOTAL.

7. Move your cursor to B9. Type the following function formula: @SUM(B3..B7) and

8. Move your cursor to A11. Type the label AVERAGE.

9. Move your cursor to B11. Type the following function formula: @AVG(B3..B7) and

10. Move your cursor to A13. Type the label SMALLEST.

11. Move your cursor to B13. Type the following function formula: @MIN(B3..B7) and

12. Note that in addition to @SUM, @AVG, and @MIN, 1-2-3 has many commonly used functions in various fields self-contained including functions for business, mathematics, and engineering.

13. Try working with these other two functions:

    @MAX(range)--Chooses the largest value in the range of cells.
    @COUNT(range)--Tells how many non-blank entries there are in the range.

14. For fun, go back to B7 and insert any new number. Watch the results. All function entries will be recalculated to reflect entry changes.

15. When you are finished experimenting with functions, power down to end session.

1-2-3 Commands

/Worksheet Commands

Global	Overall worksheet settings
Format	Number Formula display
Label Prefix	Alignment of labels
Column-Width	1-72 characters
Recalculation	Formula recalculation procedures
Protection	Enable Disable cell protection
Default	Standards for printing, current disk
Insert	Create empty rows columns
Delete	Eliminate rows columns
Column Width	1-72 characters
Erase	Erase worksheet and settings
Titles	Freeze rows columns onscreen
Window	Split Unsplit display window
Status	Display global settings

/Range Commands

Format	Number Formula display
Label Prefix	Alignment of labels
Erase	Erase cell entries
Name	Maintain set of names for ranges
Justify	Adjust width of label "paragraph"
Protect	Disallow changes to cells (if Protection Enabled)
Unprotect	Allow changes to cells
Input	Restrict pointer to unprotected cells

/Copy Command

Copy entries to new location(s)

/Move Command

Move entries to new location

/File Commands

Save	Store entire worksheet in *worksheet file*
Retrieve	Restore data from *worksheet file*
Combine	Incorporate (part of) *worksheet file* into current worksheet: methods: Copy, Add, Subtract use Entire-File or Named-Range only
Xtract	Store range of entries in worksheet file: save Formulas or current Values only
Erase	Erase one or more 1-2-3 datafiles
List	List names of 1-2-3 datafiles, report disk space
Import	Incorporate *print file* into worksheet: treat lines as Text or as Numbers and quoted text
Directory	Change *current directory* assignment

/Print Commands

Printer vs. File	Direct output to printer or *print file*
Range	Range to be printed
Line	Advance printer one line
Page	Advance to top of next page
Options	Page formatting
Header, Footer	Set page header footer line
Margins	Left, Right, Top, Bottom
Borders	Graft extra columns rows to print Range
Setup	Set printer-control characters
Page-Length	Set number of lines
Other	As-Displayed vs. Cell-Formulas: Printing of formula texts Unformatted vs. Formatted: Suppress headers, footers, page breaks
Clear	Cancel print settings
Align	Reset line-number counter to 1
Go	Print the selected range

Function Keys

F1 Help	Display Help screens — press [Esc] to return to Ready Mode
F2 Edit	Switch to/from Edit Mode for current entry
F3 Name	(Point Mode only) Display menu of range names
F4 Abs	(Point Mode only) Make/Unmake cell addresses "absolute"
F5 GoTo	Move cell pointer to a particular cell
F6 Window	(Split-screen only) Move cell pointer to other window
F7 Query	Repeat most recent Data Query operation
F8 Table	Repeat most recent Data Table operation
F9 Calc	Ready Mode: Recalculate worksheet Value and Edit Modes: Convert formula to its current value
F10 Graph	Draw graph according to most recent graphing specifications

Names for 1-2-3 Data Files

Names assigned to 1-2-3 worksheet, print, and graph (picture) files may be at most eight characters long, and must consist of these characters only:

A B .. Z a b .. z 0 1 .. 9 _ (underscore)

Notes:

1. Uppercase and lowercase letters are equivalent.

2. Don't try to enter a filename extension. 1-2-3 automatically uses these extensions:

   .WK1 worksheet file
   .PRN print (text) file
   .PIC graph (picture) file

3. To specify a file that is not stored on the current disk (DOS 1.10) or the current directory (DOS 2.00), use a disk prefix:

   C:SALESFIG B:JAN_JUN

With DOS 2.00, specifying a disk prefix causes 1-2-3 to use the directory that was most recently made current on that disk.

GETTING HELP. At any time during your 1-2-3 session you can view a Help Screen tailored to your current situation. You can even take a "tour" through a series of help screens. 1-2-3 always keeps your place for you--when you press (Esc) you will return to the worksheet exactly where you left off.

To get the Help Screen:

1. Press F1/Help Key.
2. "Tour" several Help screens. To select another Help screen, move the highlight to a topic and press .
3. Return to your worksheet by pressing (Esc).

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LESSON E

USING COMMANDS TO SAVE RETRIEVE FILES

To start a command, press a slash (/). You will see the Mode change to MENU. A list of keywords indicating commands will appear on the second line in the Control Panel. By selecting a keyword with the pointer highlight, you can build up a command, one keyword at a time. 1-2-3 shows you exactly what your choices are. It even displays long prompts (explanatory phrases) on the line below the keywords.

SAVING YOUR WORKSHEET

When you want to save your new file on a disk, you must use the /File Save command. If you do not save your worksheet, it will be lost once the power is turned off. If you want to save, you must place an initialized or formatted disk in Drive B. Then execute the SAVE command using the following procedure:

1. Press slash (/) to get the Command Menu. A list of prompts will appear in the Control Panel. The highlight will be on worksheet.

2. Move the Menu pointer (highlight) on the keyword FILE or type the first letter F and Press . Another list of prompts appear on the screen.

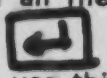
3. Move the Menu pointer to SAVE or type the first letter S and press to select it. Another prompt will appear telling you to name your file.

4. Type in File name. A file name may be up to 8 characters long, but may not include spaces or any other characters other than letters (A-Z) or numbers (0-9). If you try to create a file with a name that is already used for another file stored on your disk, 1-2-3 informs you of this situation. You will get a prompt: Cancel Replace. If you choose to replace the file, the data in the existing file will be lost. If you choose Cancel, then use the storage command and rename your file.

5. Press . The red light on your disk drive will go on. This light signals that information is being transferred from the computer's main memory into the diskette.

RETRIEVING A FILE

When you want to bring back a file that has been previously stored on a disk, you must use the /File Retrieve command. To execute the /File Retrieve command follow this procedure:

1. Press slash (/) to get Command Menu.
2. Move the Menu pointer to File and Press
3. Point to Retrieve and press to select it.
4. To enter the file name, you may either type the exact name of the file you want to retrieve, or move pointer to the name of your file from the listing of all files stored on your disk that appears in the Control Panel and 

   CAUTION: Do not use this command when another worksheet that you have not saved on your screen. Your information will be erased by selecting /File Retrieve, and the file you have retrieved will appear on the screen.

5. The file you have retrieved should appear on the screen, ready for you to use.

EDITING A FILE

You may make changes on your existing worksheet at any time by using the /File Retrieve and then the (F2/Edit) key. You may change a label, value, or formula contained in a cell or in a range of cells. The changes will be typed on the edit line of the Control Panel and once entered, will be displayed on the screen. If you wish to save the changes, you must use the /File Save command to save your file again--under the same name or under a different name.

To correct or edit existing entries:

1. Move pointer to cell address
2. Press (F2/Edit) key to have 1-2-3 place a copy of the entry in the Control Panel.
3. Type your corrections.
4. Press after each correction

DELETING A FILE

If you want to erase or delete a file from disk storage, you must use the /File Erase command. Once you've deleted a file, all the contents are lost. Be sure you no longer want the information in that file before deleting. To execute the /File Erase command:

1. Press slash (/) to get the Command Menu.
2. Move the Menu pointer to File and press ↵ to select it.
3. Move the Menu pointer to Erase and press ↵ .
4. Your highlight will be on worksheet - press ↵ .
5. Enter name of file to erase. Either type or point to the name of the file you wish to erase. Press ↵ .
6. If you want to Cancel the command point to No and ↵ . The file will remain on disk. If you want to delete the file, point to Yes and press ↵ . Your file will be erased.

EXERCISE 4

SAVING AND RETRIEVING

1. Insert your Lotus 1-2-3 Program Disk. Press Enter key for Copyright information to disappear.

2. A blank worksheet should now appear on your screen. The cursor is in cell address A1.

3. Insert an initialized disk into Drive B.

4. Enter the label STORAGE into cell A1 and the label EXERCISE into B1.

5. Move your cursor to C1. Type the label RED FILE into C1.

6. Type the following values into the cell indicated.
   1500 in B3
   1600 in C3
   1750 in D3

7. Now you will save the RED FILE on your disk in Drive B. Execute the command to save by:
   Pressing /
   Move menu pointer to File or type F and ↵
   Move menu pointer to Save or type S and ↵
   Name your file RED

8. You must clear your screen before starting a new file. To do this press / Worksheet Erase and your screen will be clear. Your file should have been saved on your disk. If you want to retrieve that file later, use the / File Retrieve command and it will appear on the screen.

9. To start a new worksheet, type the following labels in the cells indicated:

A1	STORAGE
B1	EXERCISE:
C1	PART 2
A3	BLUE.FILE
A8	TOTAL
B7	--------- (this is a label so start with an ')

10. Enter the following values in the cells indicated:

B4	500
B5	1012
B6	199

11. Enter the following formula in cell B8: +B4+B5+B6 and ↵

12. Now save BLUE FILE by executing the / File Save command
    Name your file BLUE.

EXERCISE 4 (Continued)

13. Now we will retrieve a file. Let's bring back the RED FILE which we have stored on your disk earlier.

    Press / to get the Command Menu.
    Move Menu pointer to File or type F and ↵
    Move Menu pointer to Retrieve or type R and ↵

14. The RED FILE should appear on your screen exactly as it was when you saved it. You can now work on it if you like, adding more values, labels, and formulas. You may change any cell by using the (F2/Edit) key, typing the new entry and ↵ .

15. After making your changes or new entries in your RED FILE, you must save your changes, otherwise the changes will not be stored. Use the / File Save command. When the prompt appears to name your file, you may give it the same name. Your old file will be erased and the new one will replace it.

16. If you want to experiment further with retrieving and editing a file, clear your screen by executing the / Worksheet Erase command. Then use the / File Retrieve command to get the BLUE FILE. Proceed to make your changes. Save your changes.

17. When you are through experimenting, power down to end the session.

LESSON F

PRINTING

The / Print commands allow you to obtain a printed copy (hardcopy) of worksheet data. You can print an entire worksheet or you can excerpt one or more ranges for printing. You can send print output directly to the computer's printer, or you can store it in a print file for printing later. The / Print command also offers options for adjusting formats, printing page headings, numbering pages, etc. For our purposes, we will only explain how to print your worksheet by sending your output directly to the printer. Make sure that you have a printer that is properly connected to your IBM PC so that the file in computer memory can be sent to the printer and print it.

The / Print command exactly reproduces a rectangle of information from your worksheet just as you see it on the screen. To print, you will need to do the following:

1. Mentally identify the cell locations (entire worksheet or the portion you want printed).
   - the cell address in the UPPER LEFT corner of the part of the worksheet you want to print.
   - the cell address in the LOWER RIGHT corner of the part of the worksheet you want to print.
2. Give the printing instructions to 1-2-3. (Make sure printer is on).

To execute the / Print command:

1. Press / to get the Command Menu.
2. Move pointer to Print and
3. Your highlight is on Printer and
4. Your highlight is on Range and
5. Enter the print range you wish printed by typing the cell address in the upper left corner of the part of the worksheet you want to print and the cell address of the lower right corner of the part of the worksheet you want to print.
6. Select Go and to send the contents of the print range to the printer.
7. The printer should start printing your file. When printing is completed, 1-2-3 will return to the / Print menu. To return to Ready Mode, select Quit.

EXERCISE 5

PRINTING

1. Insert your Lotus 1-2-3 Program Disk. Press Enter key for copyright information to disappear. Insert your initialized disk in Drive B.

2. A blank worksheet should now appear on your screen. The cursor is in a cell address A1.

3. Type the label PRINTING into A1 and the label EXERCISE into B1.

4. Type the following labels in the cells indicated:

A30	MIDDLE
A31	NEXT LINE
A59	AT THE
A60	BOTTOM

5. Move your cursor to H1 and type the label UPPER in H1.

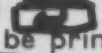
6. Move your cursor to H2 and type the label RIGHT into H2.

7. Type the following labels into the indicated cells:

H30	MIDDLE
H31	NEXT LINE
H59	LOWER
H60	RIGHT

8. Now identify the cell location of the lower right corner. Now mentally identify the range you wish printed. We will print the entire worksheet. The cell address of the upper left corner is A1. Assume you have an 80-column printer. The farthest right of Column A you can print is Column H. In this exercise, use H60 as your lower right corner.

9. We are ready to print (make sure your printer is turned on). Execute the printer command as follows:

   Press / to get the command menu.
   Move to Print and
   Point to Printer and
   Point to Range and 
   Type the range to be printed and
   Point to Go and

10. Your printer will begin printing. When the printing is completed, you will go back to the / Print menu. Select Quit and

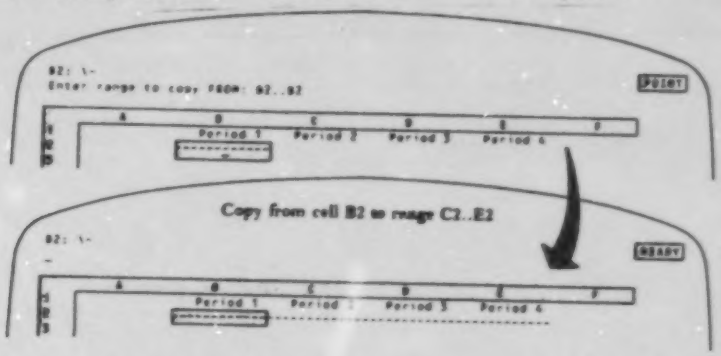
11. Power down to end the session.

LESSON G

COPY COMMAND

The / Copy command creates new cell entries that are copies of existing entries. This can save you a great deal in time and keystrokes. The Copy command can be used to duplicate or repeat values, labels, formulas, or symbols from one cell (or group of cells) to any other cell (or group of cells). When copying the data in a cell or a group of cells, you must specify the FROM range (the cell or cells from which data is to be moved) and the TO range (the cell or cells into which the copy is to be made).

Below is an example where the label ------ is copied:



When dealing with formulas, though, you rarely want 1-2-3 to perform exactly the same calculation at several different places in the worksheet. It's more likely that you'll want 1-2-3 to help you enter a set of similar, but not identical calculations. The key is that many formulas that seem to be merely similar are, in fact, precisely the same. When copying formulas, you will have to decide whether each of the cell addresses being copies are absolute or relative.

When 1-2-3 copies a formula, for example: +A3+A4+A5

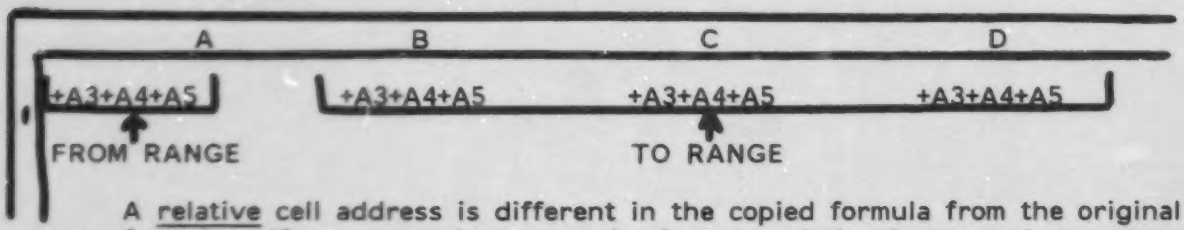
- An abolute cell address is exactly the same in the copied formula as in the original formula. If you wanted to move the formula with no change you would press / Copy and enter the following range:

  FROM: A1..A1 TO: $B1..$D$1

Anything preceded by a $ in a formula will be copied with no change or as absolute.

BEST COPY AVAILABLE

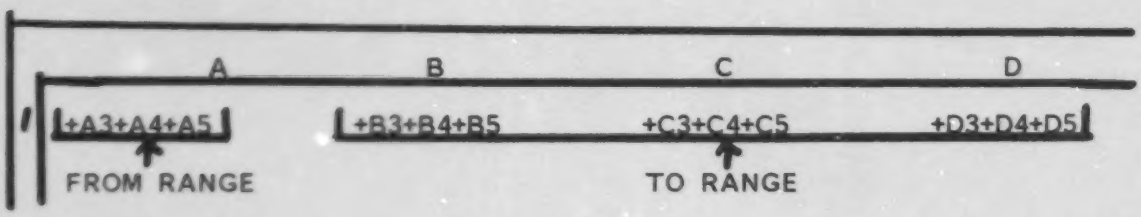
The formula would be "buried" in each of the cells specified in the TO range as follows:



A relative cell address is different in the copied formula from the original formula. If you wanted to move the formula relative in its entirety, you would press / Copy and enter the following range:

FROM: A1..A1 TO: B1..D1

The formula would be "buried" in each of the cells specified in the TO range as follows:

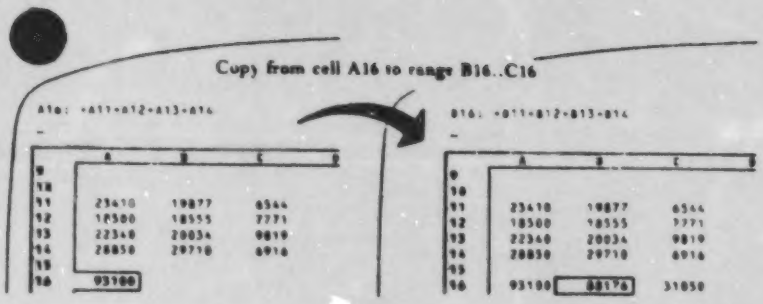


USING THE / COPY COMMAND

Follow this procedure to / Copy one or more cell entries:

1. Select the / Copy command.
2. Indicate a "From" cell or range--the cells whose entries you wish to copy. Decide if you want the formula copied relative or absolute. Include $ if you want the formula copied absolute.
3. Indicate a "To" cell or range. Decide if you want the formula copied relative or absolute. Include $ if you want the formula copied absolute.
4. Press .

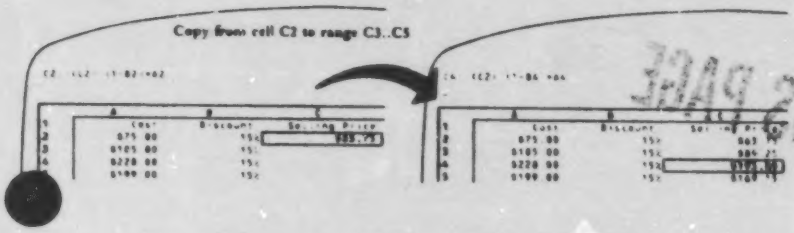
Review the follwing examples to get a clearer picture of the / Copy command.



Example 1: Copying a Formula — Relative Cell Addresses

1. Formula typed in cell A16: +A11+A12+A13+A14
2. /Copy command specs:
   FROM range: A16
   TO range: B16..C16
3. Resulting formulas in TO range:

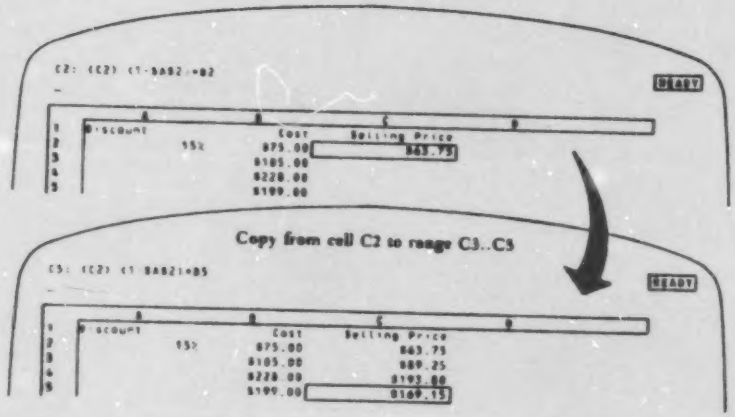
B16:	+B11+B12+B13+B14
C16:	+C11+C12+C13+C14



Example 2: Copying a Formula — Relative Cell Addresses

1. Formula typed in cell C2: (1-B2)*A2
2. /Copy command specs:
   FROM range: C2
   TO range: C3..C5
3. Resulting formulas in TO range:

C3:	(1-B3)*A3
C4:	(1-B4)*A4
C5:	(1-B5)*A5



Example 3: Copying a Formula — Absolute and Relative Addresses

1. Formula typed in cell C2: (1-A2)*B2
2. Resulting formulas when copied

C3:	(1-A2)*B3
C4:	(1-A2)*B4
C5:	(1-A2)*B5

BEST COPY AVAILABLE

EXERCISE 7

COPYING LABELS, VALUES, AND FORMULAS

A blank VisiCalc worksheet should now be showing on your screen.

Please make the following keyboard entries in the order given:

1. Type COPY EXAMPLE: SALES BUDGET into A1, B1, C1, and D1. Use the ESC key to backspace for corrections, if necessary.

(Reminder: The standard VisiCalc column is nine characters wide.)

2. Move your cursor to A3. Type the label MONTHS into A3.

3. Type the following labels into the indicated cells:

A4	---------(1,11 or ^ required first)
A5	SALES
A6	LESS: COST
A7	---------
A8	GR MARGIN
A10	MRKTG EXP
A11	G & A EXP
A12	OTHER EXP
A13	=========(1,11 or ^ required first)
A14	OP. PROFIT

4. Type the following labels into the indicated cells:

B2	1982 ("required)
B3	JANUARY
C3	FEBRUARY
D3	MARCH
E3	TOTAL QTR

5. Type the following values and formulas into the indicated cells:

B5	20000
B6	.40*B5
B8	+B5-B6
B10	4000
B11	2000
B12	500
B14	+B8-@SUM(B10.B12)
E5	@SUM(B5.D5)

EXERCISE 7 (Continued)

Repeating Labels, Values, and Formulas

6. Type the following commands into the cells indicated before each type / then select COPY.

B2..B2:	C2..E2
E5..E5:	E6..E13
A4..A4:	B4..E4
B6..B6:	C6..D6
A7..A7:	B7..E7
B8..B8:	C8..D8
B10..B12:	C10..D10
A13..A13:	B13..E13
B14..B14	C14..E14

Note In B10 above you copies a range of cells

7. Type the following values into the indicated cells.

C5	26000
D5	31500

8. You have now completed the exercise. Try changing some values. Then power down.

SUGGESTED APPLICATIONS

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SUGGESTED APPLICATION #1

SALES AND EXPENSE REPORT

Below is an estimate of A-X Photocopying Company's sales and expenses for the upcoming month. Using your VisiCalc or Lotus 1-2-3 program, key in the data below and determine A-X Photocopying Company's estimated profit given the sales and expenses as listed.

Directions:

1. Key in the labels. Abbreviate where necessary or use two columns to label.
2. Place given sales and expense figures in the correct coordinates.
3. Enter the correct formulas for finding Total Estimated Expenses and Net Estimated Profit.
4. See what happens if sales increase to $3,000.00 and postage and mailing increases to $80.00.

A-X Photocopying Company

Estimated resources:	
Sales	$2,750
Estimated expenses:	
Rent	$ 200
Salaries	2,000
Telephone	84
Postage and mailing	40
Paper	450
Total Estimated Expenses	_____
Net Estimated Profit	_____

SUGGESTED APPLICATION #2

PERSONAL BUDGET

The Miller family uses a cash payments record which has a special column for each kind of payment. Their cash payments record for July is shown below:

WEEK	RENT	FOOD	CLOTHING	OTHER	SAVINGS	TOTAL PAYMENTS
1-7	275.00	86.25	28.18	16.12	25.00	
8-14		28.15		7.85		
15-21		35.80	18.20	29.13		
22-28		40.26		12.60		
29-31				5.25	25.00	
TOTALS						

PERFORM THE FOLLOWING: (Use your VisiCalc or Lotus 1-2-3 Program)

1. Label Columns and Rows
2. Enter the figures given.
3. Enter the correct formula to add each of the columns across to find the total payments for each week.
4. Enter the correct formula to add each of the six columns down and place your answer in the total columns. Check your work by adding horizontally the totals of the five Payment columns. The sum should equal the total of the Total Payments Column.

SUGGESTED APPLICATION #3

COMPARISON OF BUDGETED AND ACTUAL EXPENSES

Below is a Budget for the law firm of Taft & Hardy for one month. Enter the data given using your VisiCalc or Lotus 1-2-3 program on to the Electronic Worksheet. Determine the totals for budgeted and actual expenses. Then determine the difference between budgeted and actual. See if there was a gain or loss for an item.

Directions:

1. Label the columns and rows. (Abbreviate where necessary)
2. Enter the figures given.
3. Determine totals using the correct formula.
4. Determine the implement the formula for gain or loss for each item.

Expenses	Budget	Actual	Gain or Loss
Salaries	$16,000	$16,000	
Insurance	100	100	
Rent	450	450	
Printing	300	240	
Stationery	60	70	
Telephone	120	230	
Postage & mailing	90	83	
TOTALS			

SUGGESTED APPLICATION #4
BANK RECONCILIATION STATEMENT

Complete the Bank Reconciliation Statement below.

DIRECTIONS: 1. Enter labels (abbreviate where necessary)
2. Enter the figures given
3. Determine the formulas to be used and enter them

BANK RECONCILIATION STATEMENT

Checkbook Balance		3,925.96	Bank Balance		4,857.85
Less: Service Charge	3.50		Plus: Outstanding Deposit	500.00	
			Less: Outstanding Checks	325.86	
				217.59	
				57.34	
				791.15	
				48.85	
			Total Outstanding Checks		
Adjusted Checkbook Balance			Adjusted Bank Balance		

Questions to Answer:

1. What is the adjusted Checkbook Balance? _____
2. What is the total of Outstanding Checks? _____
3. What is the adjusted Bank Balance? _____

SUGGESTED APPLICATION #5

FIGURING GROSS PAY

Below is an Employee Time Sheet requiring you to determine overtime and regular pay for the employees shown and figure total earnings:

PAYROLL FOR THE WEEK ENDING _____

Name (Column)	Reg. Hrs.	Reg. Rate	Overtime Hrs	Overtime Rate	Total Regular Pay	Total Overtime Pay	Total Gross Pay
Brookes, T. R.	40	3.50	12	5.25			
Buxton, W. P.	40	3.50	11	5.25			
Crane, Goo	40	4.00	13	6.00			
Cox, B. F.	40	3.80	9	5.40			
Elton, C. H.	40	3.75	8	5.33			
Francis, Jas	40	4.00	10	6.00			
George, Ira	40	4.00	9	6.00			
Gilbert, Robert	40	3.50	7	5.25			
Totals							

Use your VisiCalc program to do the following:

1. Label columns and rows (abbreviate where necessary).
2. Enter the figures given.
3. Determine the formula for figuring regular and overtime pay for each employee and insert.
4. Determine the formula for figuring total for each employee and insert.
5. Determine the formula for obtaining total to be paid in Regular Pay and Overtime Pay.
6. Also insert formula to give total to be paid to all employees that week.

SUGGESTED APPLICATION #6

FINANCIAL STATEMENTS

The following application problems will broaden your understanding of the advantages of a computerized accounting system. You will use your program to calculate the financial statements of Valley Transportation Co., a business supplying freight deliveries for various commercial and industrial customers.

Use your program to do the following:

1. Prepare a Trial Balance
2. Prepare an Income Statement
3. Prepare a Balance Sheet

DIRECTIONS:

1. Enter labels for columns and rows.
2. Enter the figures which are given.
3. Calculate totals using formulas correctly inserted in all 3 financial statements.

VALLEY TRANSPORTATION COMPANY

TRIAL BALANCE
07/30/84

TITLE	NO	DEBIT	CREDIT
CASH	101	7500.00	
A/C RECEIVABLE	121	5000.00	
LAND	161	10000.00	
BUILDING	171	49100.00	
A/C PAYABLE	211		3500.00
MORTGAGES PAYABLE	261		41500.00
WEST-CAPITAL	301		17600.00
SALES	401		20900.00
ADVERTISING EXPENSE	501	100.00	
INSURANCE EXPENSE	502	1200.00	
MAINTENANCE EXPENSE	503	7200.00	
SALARIES EXPENSE	504	2800.00	
SUPPLIES EXPENSE	505	150.00	
TRANSPORTATION EXPENSE	506	100.00	
UTILITIES EXPENSE	507	350.00	
TOTAL			

SUGGESTED APPLICATION #6 (Continued)

2.

VALLEY TRANSPORTATION COMPANY

INCOME STATEMENT
FOR THE PERIOD ENDING 07/30/84

REVENUE		
SALES		20900.00
TOTAL REVENUE		
EXPENSES		
ADVERTISING EXPENSE	100.00	
INSURANCE EXPENSE	1200.00	
MAINTENANCE EXPENSE	7200.00	
SALARIES EXPENSE	2800.00	
SUPPLIES EXPENSE	150.00	
TRANSPORTATION EXPENSE	100.00	
UTILITIES EXPENSE	350.00	
TOTAL EXPESNES		11900.00
NET INCOME		

SUGGESTED APPLICATION #6 (Continued)

3.

VALLEY TRANSPORTATION COMPANY

BALANCE SHEET
07/30/84

ASSETS	
CASH	7500.00
ACCOUNTS RECEIVABLE	
A/C RECEIVABLE	5000.00
LAND	10000.00
BUILDING	49100.00
TOTAL ASSETS	
LIABILITIES	
ACCOUNTS PAYABLE	3500.00
MORTGAGES PAYABLE	41500.00
TOTAL LIABILITIES	
OWNER'S EQUITY	
WEST-CAPITAL	26600.00
TOTAL LIABILITIES & OWNER'S EQUITY	

SUGGESTED TESTS
FOR VISICALC

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SUGGESTED FILL-INS

VISICALC

1. When you work with VisiCalc, you will be working on a grid of columns and rows called a(n)_____ _____ _____.
2. COST and "1984 are examples of _____.
3. A blank disk must be _____ before it can be used to store data.
4. Before data is entered into the work area, it is displayed on the _____ _____.
5. To move the cursor directly from one cell to another cell you can use the shift key and the _____ _____ symbol.
6. To update a file that has been previously stored on your disk, you must _____ it.
7. If you preceed the first letter in a formula with a +, the computer assumes the input to be a _____.
8. What symbol is shown in the Direction Indicator by VisiCalc to indicate the moving of the cursor vertically _____?
9. If you wish to add C3 through C7, write the formula to be used to find the total: _____.
10. When you replicate in the VisiCalc program, information passes from the source range to the _____ _____.

MATCHING FOR VISICALC

Write the number from Column I in the blank that best matches the defination in column II.

COLUMN I	COLUMN II	
1. Boot Up	1. The highlighted bar at the top of the screen just above the column labels containing the entry line and prompt line.	_____
2. Cell	2. Horizontal positions across the top grid of the Electronic Work Sheet.	_____
3. Columns	3. Starting the operating system of a micro computer with a disk.	_____
4. Cursor	4. All information stored on a disk by title.	_____
5. Display Area	5. Work area in which labels or values are entered, manipulated or displayed.	_____
6. Error Message	6. An instruction to calculate a range of values.	_____
7. File	7. A command which affects the entire worksheet.	_____
8. Formula	8. The place at which a row and column intersect.	_____
9. Global	9. An indication of an error in data entry shown by the computer to the operator.	_____
10. Range	10. A square of light that moves across the screen and shows where the data is to be entered.	_____
11. Replicate		
12. Window		

SHORT ESSAY (VISICALC)

1. List the 4 steps in the Data Processing Cycle.

2. Name at least 3 financial records you could process using VisiCalc:

3. List the order in which mathematical calculations are performed by a computer:

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4. List the steps you would take to store the file named Green File:

5. Below is a list of 5 commands. Explain what action they will cause the computer to take in VisiCalc:

   /B

   /C

   /P

   /R

   /M

ANSWER SHEET FOR VISICALC

SUGGESTED FILL-INS:

1. Electronic Work Sheet
2. Labels
3. Initialized
4. Edit Line
5. Greater Than
6. Retrieve
7. Value
8. I
9. @sum(C3...C7)
10. Target Range

MATCHING TEST:

1. 5
2. 3
3. 1
4. 7
5. 12
6. 8
7. 9
8. 2
9. 6
10. 4

SHORT ESSAY:

1. Data Origination
2. Input
3. Processing
4. Output

2. Possible answers:
   Budget
   Check Reconciliation
   Invoice
   Trial Balance
   Balance Sheet

3. Parentheses
   Exponents
   Multiplication
   Division
   Addition
   Subtraction

4. Press /
   Press S
   Press S
   Type in: Green File
   Press Return

5. /B Sets an entry to blank

   /C Clears the sheet--setting all entries to blank

   /P Outputs a VisiCalc sheet

   /R Allows you to make copies of entries

   /M Moves an entire row or column to a new position

SUGGESTED SKILL TEST

Using your (Lotus 1-2-3 or VisiCalc) program arrange the following problem on a worksheet, solve, and print a hard copy of your solution.

DIRECTIONS:

1. Label Column and Rows. (Abbreviate where necessary)
2. Enter numbers as given.
3. Enter correct formulas

Checkbook Balance	=	127.19
Service Charge	=	1.10
Bank Balance	=	178.15
Outstanding Deposit	=	.-0
Outstanding Check	=	30.00
Outstanding Check	=	22.06

Fill in the following amounts:

Adjusted Checkbook Balance	=	$_____
Total Outstanding Checks	=	$_____
Adjusted Bank Balance	=	$_____

SUGGESTED TESTS

FOR LOTUS 1-2-3

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SUGGESTED FILL-INS (LOTUS 1-2-3)

1. When you work with Lotus 1-2-3, you will be working on a grid of columns and rows called a(n) _____ _____.
2. COST and '1984 are examples of _____.
3. If you enter ------ Lotus 1-2-3 will assume the entry to be a(n) _____.
4. Another name for the cursor in Lotus 1-2-3 is the _____.
5. To move the cursor to A1 immediately from any location on the worksheet, press the _____ key.
6. A slash key will bring a list of choices to the screen called a(n) _____.
7. Before data is entered into the work area, it is displayed on the _____.
8. To update a file that has been previously stored on your disk, you must first _____ it.
9. If you wish to add C3 through C7, write the formula to be used to find the total: _____.
10. If we copy the formula A3+A4+A5 as FROM: A1..A1 TO: B1..D1, Lotus 1-2-3 assums we want the formula to be _____ to its cell addresses.

MATCHING FOR LOTUS 1-2-3

Write the number from Column I in the blank that best matches the defination in column II.

COLUMN I	COLUMN II	
1. Boot Up	1. The portion of the screen just above the column labels containing the entry line and prompt line.	_____
2. Cell		
3. Columns	2. Horizontal positions across the top grid of the Electronic Work Sheet.	_____
4. Cursor		
5. Control Panel	3. Starting the operating system of a micro computer with a disk.	_____
6. Error Message		
7. File	4. All information stored on a disk by title.	_____
8. Formula		
9. Global	5. A rectangular group of cells on the worksheet.	_____
10. Range		
11. Replicate	6. An instruction to calculate a range of values.	_____
12. Window		
	7. A command which affects the entire worksheet.	_____
	8. The place at which a row and column intersect.	_____
	9. An indication of an error in data entry shown by the computer to the operator.	_____
	10. A square of light that moves across the screen and shows where the data is to be entered.	_____

SHORT ESSAY LOTUS 1-2-3

1. List the 4 steps in the Data Processing Cycle.

2. Name at least 3 financial records you could process using VisiCalc:

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3. List the <u>order</u> in which mathematical calculations are performed by a computer:

4. List the steps you would take to <u>store</u> the file named Green:

5. Give the correct command procedure to follow on Lotus 1-2-3 to make a hard copy of your worksheet screen. Explain what action the computer will take on each command:

ANSWER SHEET FOR LOTUS 1-2-3

SUGGESTED FILL-INS:

1. Electronic Work Sheet
2. Labels
3. Value
4. (Cell) Pointer
5. HOME
6. Menu
7. Edit line
8. Retrieve
9. @SUM(C3...C7)
10. Relative

MATCHING TEST:

1. 5
2. 3
3. 1
4. 7
5. 10
6. 8
7. 9
8. 2
9. 6
10. 4

SHORT ESSAY:

1. Data Origination
2. Input
3. Processing
4. Output

2. Possible answers:

Budget
Check Reconciliation
Invoice
Trial Balance
Income Statement
Balance Sheet

3. Parentheses
Exponents
Multiplication
Division
Addition
Subtraction

4. To store a document:

Press /
Move to File and Press
Move to Save and Press
Type the name of the file:
GREEN
Press

5. To print a file:

Press / to get line up the command menu
Move to Print
Press to get Print menu
Move to Printer
Press to give directions to printer
Move to Range
Enter Coordinates to select coordinates in range to be printer
Move to Go
Press to start the printer

SUGGESTED SKILL TEST

Using your (Lotus 1-2-3 or VisiCalc) program arrange the following problem on a worksheet, solve, and print a hard copy of your solution.

DIRECTIONS:

1. Label Column and Rows. (Abbreviate where necessary)
2. Enter numbers as given.
3. Enter correct formulas

Checkbook Balance	=	127.19
Service Charge	=	1.10
Bank Balance	=	178.15
Outstanding Deposit	=	.-0
Outstanding Check	=	30.00
Outstanding Check	=	22.06

Fill in the following amounts:

Adjusted Checkbook Balance	=	$_____
Total Outstanding Checks	=	$_____
Adjusted Bank Balance	=	$_____

BIBLIOGRAPHY

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BIBLIOGRAPHY

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